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Occasional Papers on the Kinds of Plants

By L. H. Bailey

Palms of the Mascarenes

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30. Two prominent Mascarene palms, on Round Island by Mauritius. Single tree of *Latania Loddigesii*. Six trees of *Mascarena Revaughanii*, one of the palms formerly called *Hyophorbe amaricaulis*, endemic on the little island.

L. H. Bailey
5.15.42

ARTICLE 2.
PALMS OF THE MASCARENES.

Recently it was my privilege to prepare and publish a paper on the palms of the Seychelles. It is Fascicle I of Volume VI of Gentes Herbarum, delivered to the mails February 11, 1942. I then stated the circumstances under which a study of the native palms of two archipelagoes of the Indian Ocean was undertaken. The Seychelles paper introduced publication of the twain; this paper on the Mascarenes concludes it.

These papers were inspired by the desire to understand certain palms in cultivation in the western hemisphere and about which we have had little but traditional information, rather than to undertake a study of the flora of the Mascarenes. These trees are beautiful horticultural subjects, and are worthy a studious approach by planters. The first step in satisfactory cultivation of a plant is the acquiring of accurate knowledge of its origin and characteristics and of its dependable name.

One may hesitate to publish on a critical piece of taxonomy at a time when possible recent literature is unavailable; yet, on the other hand, one cannot wait when the years are few, and risks must be taken. I have consumed much time on this paper.

The Mascarene islands lie in the Indian Ocean some 400 to 550 miles east of Madagascar, one of which was discovered by the Portuguese navigator Mascarenhas in the sixteenth century and whose name is commemorated by Alphone DeCandolle's Mascarenhasia, a genus of the Apocynaceæ. There are three main islands, Mauritius, Rodriguez and Réunion, all once held by the Dutch, then by the French, and since 1810 the two former by the British. Réunion (or Bourbon) is still French. Mauritius is scene of the romance *Paul and Virginia*. The islands lie north of the tropic of Capricorn, at approximately 20 degrees south latitude.

Mauritius, at one time Île de France, is 550 miles from Madagascar. It is a mountainous island 36 miles long and 23 miles broad. The highest peak is above 2,700 feet. Like the other two islands, it is of volcanic origin. It is known as a sugar island. The clearing of the level lands has restricted the native flora largely to river valleys and hills. The naturalized flora is extensive. Capital of the island is Port Louis, on the northwestern side, facing Madagascar. Curepipe is a residential city about 20 miles from Port Louis, at an elevation of 1,800 feet. Round Island is a small satellite of

Mauritius, about 6 miles from it, notable as the native place of a palm we have been calling *Hyophorbe amaricaulis*.

Rodriguez is only 42 square miles. It is about 350 miles from Mauritius, in an easterly direction, being farthest out to sea. Highest point in the mountainous island is 1,300 feet. Much of the native vegetation has been destroyed.

Réunion is southwest of Mauritius, comprising about 965 square miles, approximately 130 miles from Port Louis. It is mountainous, with an elevation at one point exceeding 10,000 feet. Much of the native vegetation has been removed, although a forest reservation is protected by the government. Capital is St. Denis, with botanic gardens.

Palms of Mauritius, Rodriguez, Réunion, and their small dependencies are the nine species, in four commonly accepted genera, which are the subject of this paper, although not all of them are native on all the islands; they are all endemic to the archipelago. We shall here distinguish another related species whose origin is yet unknown; and we shall learn that the true Hyophorbes are not yet cleared up. These recognized species find monography by Dr. Isaac Bayley Balfour in J. G. Baker's Flora of Mauritius and the Seychelles, 1877. It is there said that many of the smaller islands or dependencies are still botanically unexplored; nor is it to be expected that the three main islands are yet completely known as to the species and distribution of their plants, although this circumstance may not greatly affect the palms, and it is not the province of this paper, in any case, to attempt more than the palms known in cultivation from the islands, unless to clear up related nomenclature.

The Mascarene palms are not well understood in the western hemisphere even though some of them are much planted here, and as there is no native herbarium or museum material on this continent sufficient for the study of them, I applied many years ago to Sir Arthur W. Hill, Director of the Royal Botanic Gardens at Kew, England, to put me in touch with persons in the archipelago. The result has been a long-continued and valued correspondence with Dr. R. E. Vaughan at Royal College, Curepipe, Mauritius. Professor Vaughan has sent abundant specimens, photographs and notes and has written the general descriptive article (page 54) in this paper. My own problem has been the botanical identification and diagnosis of the genera and species. In the course of this study I have been compelled to make radical departure in treatment of the palms known to cultivators in the Hyophorbe group.

This account of the conditions under which these palms grow on their native islands should add interest to the planting and care of them elsewhere. Perhaps one should be surprised that palms native only to a group of small islands should thrive under widely diverse conditions in many

parts of the world. Some of these Mascarene palms have long been prominent in plantings in southern Florida, and one looks for them anywhere in western tropics unless in very dry regions. I hope this paper may heighten the respect of the planter for these singular subjects.

31. YOUNG TREE IN FRUIT of *Latania Loddigesii* in Demerara (British Guiana, South America). Native in the Mascarenes.

There is no separate flora of the Mascarene islands as a whole. Baker's Flora, already mentioned, comprises only Mauritius along with the Seychelles, although distribution may be indicated on Réunion and Rodriguez. There is a standard work on the large French island, however, Flore de L'Ile de la Réunion, by E. Jacob de Cordemoy, published in Paris in 1895. Dr. R. E. Vaughan published on the naturalized flowering plants recorded from Mauritius since the publication of Baker's Flora, in Journal of the Linnean Society, London, li, 285–308 (1937), and with P. O. Wiehe on the effect of environment on certain features of leaf structure in Mauritius in Journal of Ecology, xxvii, 263–281 (1939). He lists three palms as naturalized on the island, having escaped from cultivation: *Raphia Ruffia*, *Cocos nucifera*, *Livistona chinensis*. An early work on the plants of Mauritius is by W. Bojer, 1837, Hortus Mauritianus, ou Énumération des plantes exotiques et indigènes qui croissent a l'ile Maurice. A catalogue of the exotic plants of Mauritius was published some years earlier.

Particular credit for earlier collections should be given, as in the preface to Baker's Flora, to Sir Isaac Bayley Balfour (1853–1922), "who accompanied as naturalist the Transit of Venus expedition and remained" on Rodriguez in 1874 from August to December; also to John Horne, who went out from Kew and was Director of the Botanic Garden at Pamplemousses, on Mauritius. Horne lived from 1835 to 1905, having been born in Perthshire; he died on the island of Jersey. He had also collected in the Fiji islands and wrote particularly on the ferns of that group. Balfour was the author of Botany of Rodriguez published in Philosophical Transactions of the Royal Society of London, 1879. He mentions only three palms as indigenous to the island.

Earlier accounts than these, before the days of botanical nomenclature, are contained in the published works of travellers, but discussion or record of them is not required in the present paper.

The half-tone pictures in this Fascicle, when legended for the Mascarene islands, are enlargements from photographs supplied by Dr. R. E. Vaughan; all the others are from original photographs by the author. Pictures accredited to southern Florida are mostly taken in the plantations of Robert H. Montgomery, near Coconut Grove.

The Mascarenes

By R. E. Vaughan

The Mascarenes comprise a group of three volcanic islands situated in the South Indian Ocean between latitudes 19°S and 21°S. Mauritius, 550 miles southeast of Madagascar, is the central island of the group with Réunion 130 miles to the southwest, and Rodriguez 350 miles eastward.

Mauritius. The island was visited by Portuguese navigators during the

sixteenth century. The Dutch effected a landing in 1598, made several attempts at settlement, and finally abandoned the island. It was occupied by the French from 1715 to 1810 when it was annexed by the British.

The area of the island, including numerous small islets around the coast, is approximately 712 square miles of which about 220 are under sugar-cane.

The southeast trades blow for the greater part of the year and in the summer months from December to April hurricanes of great severity may be experienced. In the lowlands, where a rainfall of 40–75 inches a year occurs, there is a dry season from May to November, most of the rain falling in the summer months. The mean annual temperature of the lowlands is 24.5°C.

The land rises steadily to a central plateau 1,800–2,000 feet above sea level surrounded by curiously weathered peaks and denuded craters. Towards the interior of the island the rainfall increases to 175 inches a year. The mean annual temperature of the central plateau is 19.5°C.

The indigenous forests have been largely destroyed, and are now confined to a few square miles of the upland plateau. Native palms in the wild state, therefore, have become extremely rare and consist of a few isolated individuals in the less accessible river gorges and mountain reserves.

From accounts which have come down to us from early settlers it appears that a palm savannah existed on the coastal plains to the north and west under low rainfall. Owing, however, to the variety of products which could be obtained from the palms, they were very soon destroyed and at the present day no trace of this community remains.

Rodriguez was discovered by the Portuguese in 1645. It consists of a narrow basaltic ridge 13 miles long running east and west with a breadth of 3 to 5 miles. The ridge rises towards the center to form the peak of Mt. Limon 1,300 feet above sea level. The island is surrounded by fringing reefs usually about 100 yards from the shore but towards the eastern extremity of the island the reefs recede from the coast to a distance of about three miles. A plain of coralline limestone studded with caves occurs towards the southwest, affording evidence of considerable earth movements since the formation of the island. The climate is warm and equable, the mean annual temperature being 25°C. The rainfall at the principal settlement of Port Mathurin is 45 inches a year.

A French Huguenot refugee, Francois Legaut, lived for three years on the island, from 1691 to 1694. In an interesting account of the vegetation of the island at that time, Legaut describes Rodriguez as "an earthly paradise . . . composed of lovely hills covered with fine trees whose perpetual verdure is entirely charming. . . . Their spreading and lofty tops which are almost all of equal height join together like so many canopies and umbrellas and jointly make a ceiling of an eternal verdure." Today

32. Old well-grown tree of *Latania borbonica* (*L. Commersonii*) on Trinidad. Native in the Mascarenes.

the original vegetation has almost entirely disappeared. No stands of purely native trees remain excepting small patches in river reserves. Occasional individuals also occur in scrubs and thickets of exotic species.

Réunion. The area of Réunion is about 925 square miles. The island is extremely mountainous and the land rises rapidly from the narrow coastal belt to the precipitous basaltic mountains of the interior.

The dominating physical feature of the island is the immense denuded crater of the Piton des Neiges rising 10,705 feet above sea level. Radiating from this central massif are three remarkable "cirques" or amphitheaters of erosion and subsidence with precipitous cliffs from the heights of which erosion debris frequently falls to the plains below.

Towards the south, later volcanic activity has given rise to the second massif of Le Volcan comprising the two active craters, La Fournaise and Bory, both exceeding 8,000 feet.

As in Mauritius, the year may be divided into two seasons, a hot rainy season from December to April and a cool drier season from May to November. The prevailing winds are the southeast trades. The mean temperature in the lowlands varies from 26°C in the summer to 22°C in the winter, while in the uplands "cirques" the mean annual temperature is 18°C. An alpine climate is experienced on the Piton des Neiges where snow falls every year.

Owing to the mountainous nature of the country, the extent of native forest is much greater than in Mauritius, amounting to about 150 square miles. Much of this area, however, is now being invaded by exotics.

GENERA AND SPECIES OF MASCARENE PALMS

I. Species diœcious: spadix of stiff heavy branches with more or less immersed large flowers: stigma apical: fruit 4–7 cm. long, containing 1–3 obovoid or oblong strongly ribbed flat-sided or angular seeds or nutlets: leaves palmate. *Borasseæ*. . . . 1. LATANIA

II. Species monœcious, the sexes mostly in the same drooping spadix, flowers not immersed: stigma sometimes subbasal: fruit 2.5 cm. or less long, 1-seeded: leaves pinnate. *Areceæ*.

A. Flowers in narrow rows or acervuli of 5 or more, one after the other on the rachilla lengthwise, the 1, 2 or 3 at the base of the line pistillate: plant spineless: fruits plum-like, the exterior pulpy or succulent.

B. Trunk not unequally thick, turgid or tumid: pinnæ not broad-based or diagonally placed: fruit pyriform, 3 cm. or more long; seed not testaceous; embryo apical or approximately so . . . . . 2. HYOPHORBE

BB. Trunk tumid or swollen, some part thicker than other parts: pinnæ broad-based and diagonally attached: fruit not pyriform, smaller; seed testaceous; embryo lateral . . . . . 3. MASCARENA

AA. Flowers normally in clusters of 3, the middle one pistillate: fruit not with succulent exterior or plum-like.

B. Plant spineless throughout: stigma apical . . . . . 4. DICTYOSPERMA

BB. Plant spiny in spadix, on leaf-sheaths and sometimes on leaf-blades: stigma lateral to subapical . . . . . 5. ACANTHOPHŒNIX

LATANIA—THE LATAN PALMS

We now make acquaintance with three remarkable Mascarene palms, commonly planted and fruitful in southern Florida and the American tropics. They are fan-leaved Borassan palms, and therefore akin to the great Seychelles-nut or Lodoicea described in the last palm Fascicle, although the fruits do not much exceed two inches in length.

Horticultural interest in the Latans lies in the great metal-stiff palmate leaves often 6 to 8 feet across with broad segments as firm as tinplate, the colors ranging from vivid green to glaucous-blue and in young plants to pink and red or yellowish. Spadices of the staminate or male trees may be several feet long, drooping at maturity, lacking a covering spathe but provided with large bracts at the nodes from which spring hands of finger-like radiating spikes. Spadices of pistillate or female trees are very different structures, branches zigzag or somewhat horizontal, bearing relatively few great flowers and then drupe-like smooth but hard-shelled fruits inside each of which are one, two or three oddly fashioned and strangely ornamented nutlets or seeds. The trees have a durable and distinguished look, lending an air of permanence to a plantation in which the softer and flexile palms predominate. They attain medium height, perhaps to 40 feet, but are commonly seen as broad-headed low trees, for years with leaves almost touching the ground and the trees blooming freely.

Much of the attractiveness of the Latans lies in the blue, red and yellow colors on leaf-blades and petioles, and sometimes on trunks. These features are strongly expressed on fresh leaves and specially on young trees; if they disappear with age of leaf, the species may be determined by observing the new leaves as they appear. Dried dead leaves lose the colors. In the United States one does not yet see very tall trees with bare trunks.

The Latans are easily grown and not difficult in respect to soil. They are heavy feeders. In southern Florida they are comparable to the coconut in hardiness.

1. **LATANIA,** Comm. ex Juss. Gen. 39 (1789). Latan Palms.

Cleophora, Gaertn. Fruct. et Sem. Plant. ii, 185, t. 120 (1791).

Dicœcious single-trunked fan-leaved erect and stiff trees to 10, 12 or 17 m. tall at maturity, spineless but sometimes the long sharp-edged heavy petioles (particularly on young trees) with few shallow teeth; trunk not tumid, although swollen at base, leaves soon shedding, scars prominent and rough: leaves large, thick in texture, ridged underneath on ribs, the broad long-pointed segments extending to nearly one-half the depth, midrib continuing well into the palman and the blade with a slight downward curve, hastula short but strongly marked: spadices interfoliar, shorter than the leaves, axis prominent but much branched, the staminate spikes terete thickness of one's finger and issuing from the nodes, spathe repre-

sented by subtending not extended but usually long-acuminate infolding bracts within which arise the flattened peduncles bearing the spikes or rachillæ: staminate flowers very numerous, partially sunken in the rachis of the rachilla, the pits bordered by thin short obtuse bracts or scales; 3 sepals very broad, tapering and united at base, the free parts not imbricated

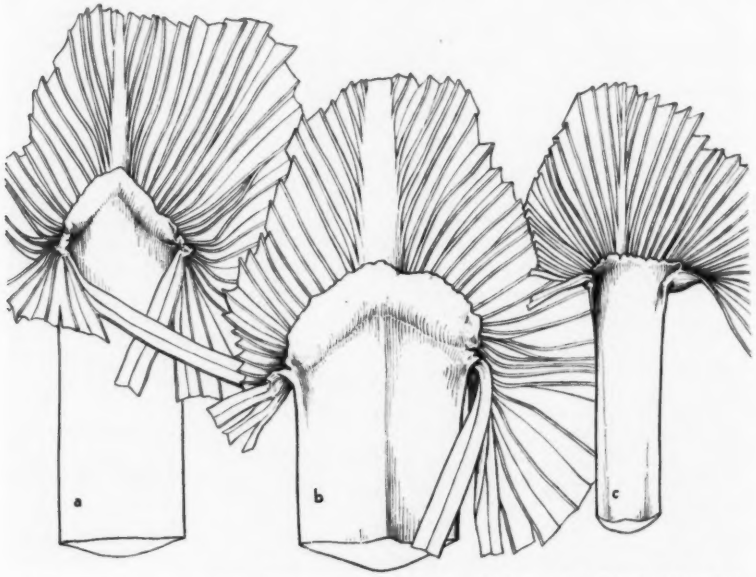
33. LEAF AS IT HANGS ON THE TREE of *Latania borbonica*. Rio de Janeiro. Six feet and more across.

after anthesis; stamens 15 to 30 or more, exserted in a bunch which is 10–13 mm. long, the flattened filaments united at base: pistillate flowers relatively sparsely placed on thick stiff rachillæ, somewhat immersed in shallow pits, the 6 accrescent stiff obtuse floral envelopes forming an open persistent cup after the fruit falls; pistil conical, little projecting beyond the cup or envelopes, 3-loculed, stigmas 3; staminodia in the form of a cup: fruit a large oblong or obovoid obtuse glabrous, green or yellow-green body 4–7 cm. long, indehiscent, with tough hard rind, typically 3-seeded but often 1–2-seeded by abortion, the mesocarp or intermediate structure thick and more or less succulent; seeds large, 3 cm. or more long, distinguished in form and markings, convex on outer or dorsal side and prominently ribbed, separating from a hard outer wall that probably is derived from the exterior integument; albumen homogeneous; micropyle apical.

Species 3, endemic on the Mascarene islands, and widely planted elsewhere in tropics and subtropics.

The word Latania is said to be derived from the native name of the palm in Bourbon, now Réunion. In its French form, Latanier, the word may now designate fan-leaved palms of various kinds, as in Haiti. As Latán, I continue the word as a vernacular.

The three Latans are very distinct, strikingly so in the seeds. One sometimes sees in plantations only a pistillate tree of one of the species and it



34. HASTULAS OF THE THREE LATANS, one-third natural size: *a*, *Latania Loddigesii*; *b*, *L. borbonica*; *c*, *L. Verschaffeltii*.

may be fruiting; this raises the question whether these seeds (if viable) will produce evident hybrids. Such hybrids appear not to be clearly recorded and I have not distinguished them, but the observer should be alert for such possibilities.

The genus Latania was monographed by Beccari in Palme della Tribù Borasseæ, published in Florence posthumously under the editorship of Count Ugolino Martelli, in 1924.

A. Leaves glaucous-blue when fresh, the blade underneath and leaf-sheath heavily covered (or until old) with thick whitish scurf or tomentum; hastula large, conic: rachillæ at maturity 25 cm. or less long: seed twice as long as broad and reticulated at top on dorsal side with strong ridges, not hispid or setose ..... 1. *L. Loddigesii*

AA. Leaves green, not heavily glaucous, but petioles and margins and perhaps blade itself suffused (until old) with color, tomentum not usually very pronounced or persistent: rachillæ at maturity mostly more than 30 cm. long.

B. Color of foliage, at least when young, reddish or purplish: segments often 6–8 cm. broad at base: hastula very broad, not conic: seed pyriform, somewhat longer than broad, with low curved ridges from end to end on dorsal side ..... 2. *L. borbonica*

BB. Color of foliage at least at first conspicuously yellowish: segments mostly less than 6 cm. broad at base: hastula a low curve, not much projected: seed oblong, lobed and beaked at apex, setose, ridged dorsally in center ..... 3. *L. Verschaffeltii*

1. **Latania Loddigesii,** Martius, Hist. Nat. Palm. iii, 224, t. 161, figs. 10–12 (1837). BLUE LATAN. Figs. 30, 31, 34, 35, 37, 38, 41.

Latania glaucophylla, Hort.

Attractive glaucous-blue palm, but the glaucosity variable and likely to disappear on old and on dead leaves, with abundant fluffy tomentum on sheaths and blades when growing, and persisting on under surface: petiole to 1 m. long and 5 or 6 cm. broad at top, hastula projecting 4 or 5 cm. into a conic margined body: blade 1 m. and more across, stiff; main segments 5–7 cm. broad at base, midrib prominent and not colored but shaggy-tomentose on under surface, the many side-veins very fine and close and not attracting attention: staminate spikes 6–10 on apex of a lateral peduncle at the nodes of the spadix, 6–12 in number (sometimes reduced to a single finger) and 10–20 or 25 cm. long, more or less woolly: fruit obovoid or pear-shaped, 5–7 cm. long, nearly cylindrical to somewhat 3-angled depending on the number of nutlets that mature, the accrescent floral cups standing well above axis of rachilla and immersed only at base; seed about 5 cm. long and 2 cm. broad near top, somewhat broader than oblanceolate in outline, glabrous, usually slightly curved toward the flattened inner face, the outer convex side marked by a strong lengthwise ridge and the upper third bearing strong cross-ridges and dependent from them.

Satellites of Mauritius, as Round, Flat and Coin de Mire islands; planted or introduced elsewhere in the Mascarenes.

This palm bears the name of Loddiges, nurserymen, father and son, of

Hackney near London, England; the father, Conrad, was born in Holland about 1743 and died at Hackney in 1826; the son, George, publisher of Botanical Cabinet, 1784–1846, was native of Hackney. The Loddiges introduced many plants to cultivation, the father obtaining American species from Bartram and Michaux. The elder Loddiges was commemorated by Sims in 1808 in the leguminous genus Loddigesia, of South Africa.

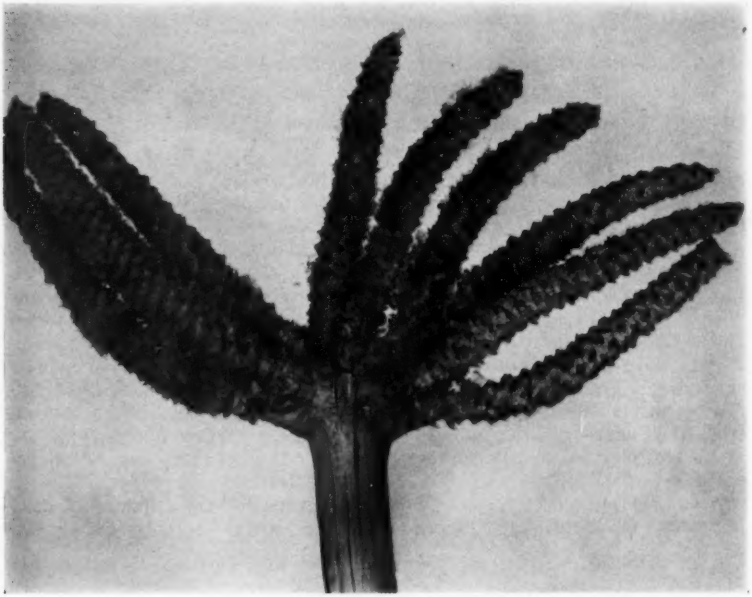
2. **Latania borbonica,** Lam. Encyc. iii, 427 (1789). RED LATAN. Figs. 32, 33, 34, 37, 39, 40, 41.

Latania Commersonii, Gmel. Syst., 1035 (1791).

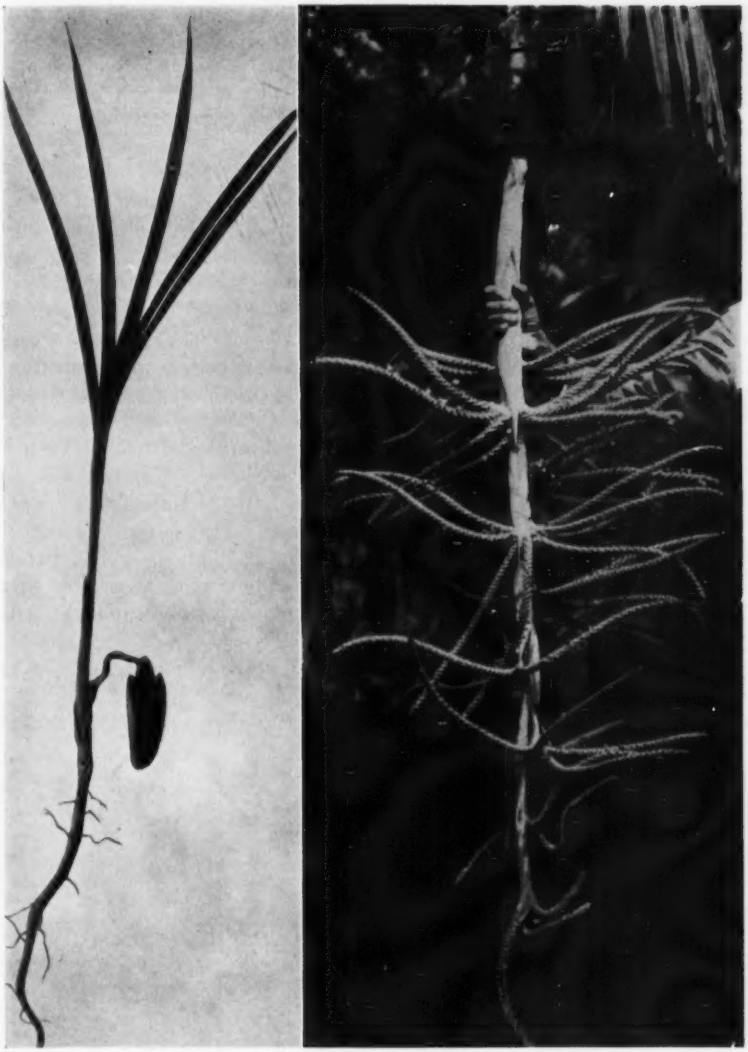
Latania rubra, Jacq. Fragm. Bot. 13, t. 8 (1809).

Cleophora lontaroides, Gaertn. Fruct. et Sem. Plant. ii, 185, t. 120, fig. 1 (1791).

Stout heavy tree to 16 m. tall at maturity, foliage gray-green or lightly glaucous but petioles and palman tinged red or violet, petiole sometimes mildly tomentose on back and the thin edges perhaps bearing sharp but hardly pointed low serrations on young plants, ribs underneath scurfy or tomentose, differing from *L. Loddigesii* in its coloring, less tomentum, broader petiole and segments, rounder hastula, coarser veining on leaves,



35. "HAND" OF SPIKELETS OR RACHILLÆ of *Latania Loddigesii*. × ½. Bermuda.



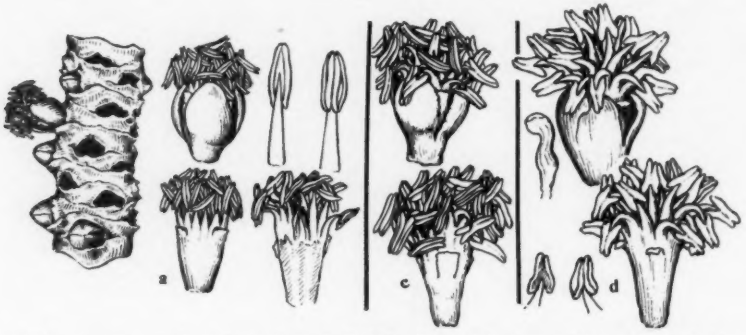
36. GERMINATION IN LATANIA, at left, *L. Verschaffeltii*, reduced. STAMINATE SPADIX of *Latania Verschaffeltii*, at right, reduced. Both in Mauritius.

and particularly in the longer staminate spikes or rachillæ and in the seeds: staminate spadices long and drooping, the clusters at nodes comprised of few or several spreading or drooping spikes or rachillæ 30 cm. and more long that are essentially glabrous: seeds pyriform, flat on inner face when 3 of them develop in a fruit, 3.5–4.5 cm. long and 2.5 cm. broad in upper part, obtuse, marked on the convex side with curved low ridges that join at the top, midrib prominent, attractive in shape and design.

Mauritius, Réunion; now widely planted.

Explanation is required on the adoption of the name *L. borbonica* of Lamarck. This Lamarckian name has been uniformly referred to *Livistona chinensis* since Martius so disposed of it in 1837 or 1838, although Bojer had retained it in Hortus Mauritianus 1837, and Balfour in 1877 makes it a synonym of *L. Commersonii* notwithstanding the discrepancy in dates. The reason for confusing Lamarck's plant with Robert Brown's *Livistona chinensis* is unknown to me. Lamarck's description of *Latania borbonica* is anything but a Livistona: diœcious, petioles spineless, ribs tomentose, stamens 15 or more (rather than 6), united at base, and other characters. His plant was obtained by Commerson on the island of Bourbon and specimens had been seen by him. Pistillate flowers and fruits were not known. He speaks of the leaves as of a glaucous color, but this is not sufficient to suggest he had the plant we know as *L. Loddigesii* which is not found on Bourbon; foliage of these two Latanias is gray or dull when dried, and Lamarck's statement clearly indicates that he did not have before him the light green leaf of *Livistona chinensis*. It is now time, after more than one hundred years, to restore the binomial *Latania borbonica* to its rightful place.

We have mentioned Commerson. He was Philibert Commerson, born in France in 1727 and died in Île de France (Mauritius) in 1773, naturalist, arduous collector of plants, associated with Bougainville's voyage around



37. FLOWERS OF THE LATANS: a, *Latania Loddigesii*, × 1½, stamens × 3; c, *Latania borbonica*, × 2½; d, *Latania Verschaffeltii*, × 2½.

the world. Forster commemorated him in the genus Commersonia, one of the Sterculia Family.

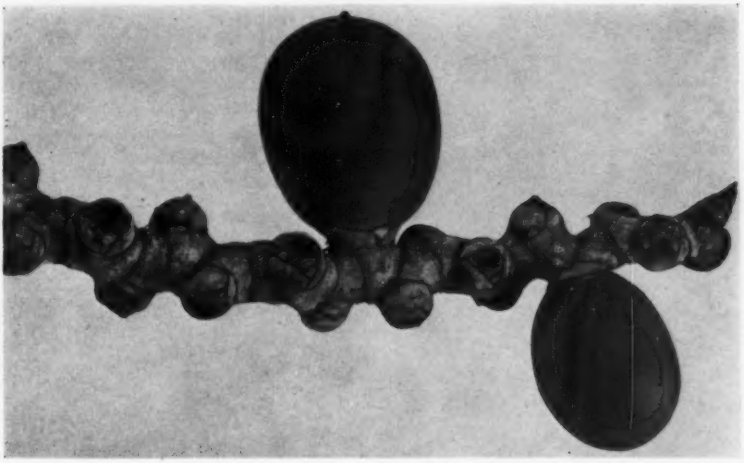
3. **Latania Verschaffeltii,** Lemaire, in Ill. Hort. vi, t. 229 (1859). YELLOW LATAN. Figs. 34, 36, 37, 39, 41.

Latania aurea, Hort.

Stout tree, reaching 16 m. in height, with normally pale green leaves which when fresh are usually suffused or at least margined with yellow and on young trees of a lively yellow-green color: blade to 2 m. long, rather thin in texture; segments 5–6 cm. broad at base, slenderly attenuate to apex, strongly many-nerved, margins often bearing shallow irregular teeth-like protuberances or even minutely jagged; hastula (at least on young plants) only slightly rounded and not prolonged; petiole yellow, more or less scurfy or tomentose underneath, deeply concave or trough-like on upper face with low ridge in bottom: staminate spadix drooping, 2–3 m. long, the spikes or rachillæ 30 cm. or more long at maturity, glabrous or at least not woolly: fruit obovoid, 4–5 cm. long, obtusely 3-angled when all the seeds mature, surface roughened; seed oblong, 4–5 cm. long, sides nearly parallel most of the way, roughly setose on the outer concave face, ridged on the keeled inner face, very strong mid-ridged on the outer side and centrally beaked and bearing a short projection or spine on either side at apex.

Island of Rodriguez, where it is or has been abundant. An attractive plant in cultivation because of its bright yellow-green color.

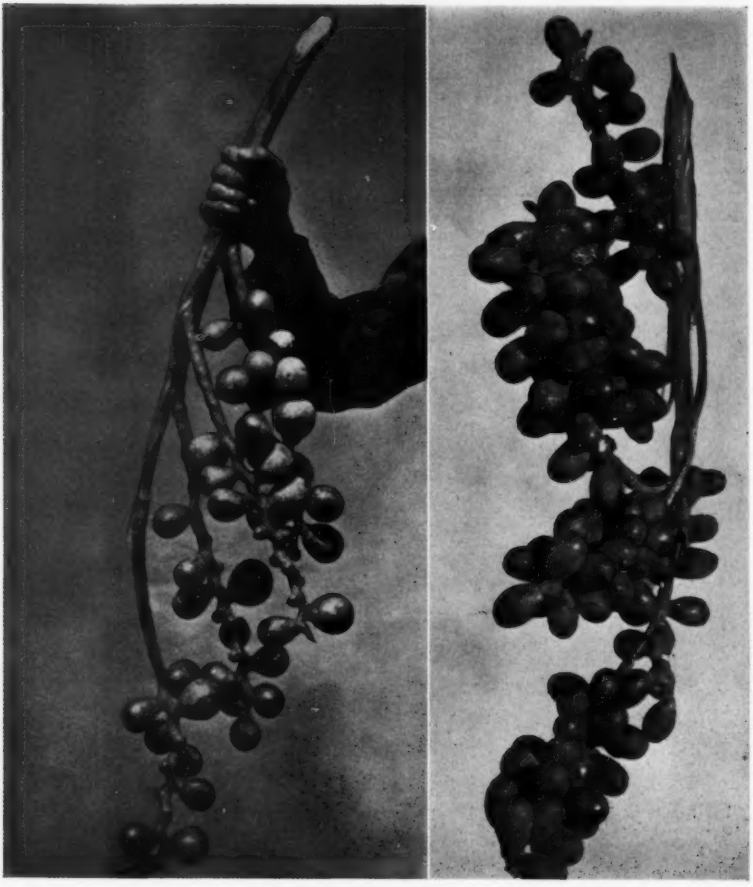
This palm bears the name of Ambroise Verschaffelt, 1825–1886, Belgian horticulturist and publisher of L'Illustration Horticole, whom we have



38. FRUITING SPIKE OR RACHILLA of *Latania Loddigesii*, three-fourths natural size. Most of the pistillate flowers did not set fruit. Southern Florida.

met in the last palm paper (Gent. Herb. vi, fasc. 1) in connection with the Seychellan genus Verschaffeltia.

In founding this species in L'Illustration Horticole in 1859, Charles Lemaire contrasts all three species of Latania in their seeds, and since that time no other species have been proposed in the genus. He did not know the precise country from which the plants came to the establishment of Verschaffelt; the yellow and orange colors are shown on the plate of the young tree and are mentioned in the text.



39. Spadices in fruit of *Latania borbonica* (left), and of *L. Verschaffeltii* (right). Mauritius.

Plate of a young tree was published in Gardeners' Chronicle, March 1, 1902, together with a descriptive note (on page 139) by Dr. Udo Dammer, as *Latania aurea*.

Germination of *Latania Verschaffeltii* is shown on the left in Fig. 36; the engraving is made from a painting loaned me by Dr. R. E. Vaughan of Mauritius. The seed is still retained, and the "string" leads from it and is interpreted as elongated base of the single cotyledon: see remarks on a similar situation in Lodoicea, Gent. Herb. vi, 27 (1942).

HYOPHORBE AND ALLIES— THE PLUM-NUT PALMS

We are next to study a set of Mascarene palms supposed to be well known and differentiated but which are in reality singularly confused. Two of them thrive and fruit well in southern Florida and the western tropics; we know them as *Hyophorbe amaricaulis* and *H. Verschaffeltii*, and they are seen in characteristic condition in Figs. 54 and 58. A third species is *H. indica*, not known as a cultivated plant, at least not in this hemisphere. They have a common denominator in the small almost drupaceous plum-like fruits, with a single hard nutlet or stone inside.

The reader should be interested to follow the complicated botanical history of these trees, and be prepared to understand the reasons for change of names and why the innovation involves another unrelated and much planted palm from another country.

Trunk strongly ringed, not thickened or tumid at any part and usually not straight: embryo apical or above middle in large verrucose fruit, and seed free inside the hardened exocarp ..... 2. Hyophorbe

Trunk lightly ringed, thickened or else conspicuously constricted at some part: embryo lateral in essentially smooth fruit, and attached inside a testa or seed-shell ..... 3. Mascarena

2. **HYOPHORBE,** Gaertn. Fruct. et Sem. Plant. ii, 186, t. 120, fig. 2 (1791).

Erect single-trunked trees of medium size, monœcious (sometimes functionally diœcious?), bole not tumid, coarsely ringed, not unusually tapering to summit, crown-shaft conspicuous: leaves pinnate, pinnæ narrow and not expanded at base: inflorescence infrafoliar, drooping in fruit; flowers few or several in short lines on the rachillæ, the lowest 1, 2 or 3 of which are pistillate; stamens 6, with very long anthers, filaments long and joined at base and attached to petals, pistillode columnar and equalling anthers in length: fruit plum-like, black or dull brown, obpyriform to obovoid but narrowed both ways and more or less bent, somewhat verrucose and sarcous when fresh; seed single, broadly elliptic and sharp-pointed at base, solid, without testa or shell but loose inside the indurated exocarp, albumen plane, embryo apical or above the middle, surface furrowed in interlocking pattern probably expressing ramifications of the raphe.

Species 2, as now understood, on Réunion and Mauritius; not known to be in cultivation unless in gardens on their own islands; apparently not ornamental palms.

A. Pinnæ conspicuously paleaceous on main veins underneath: rachis nearly flat on back (at least on middle and upper part of blade), glabrous, strongly and sharply ridged on upper surface; spadix stiff and bushy, the rachillæ scarcely pendulous: fruit curved when mature and dried, about 3 cm. long; seed gradually narrowed to base, lightly grooved, 1.5 cm. broad. 1. *H. indica*

AA. Pinnæ practically free of palea or scales on under side unless at base, usually shorter than in *H. indica:* rachis convex on back, furfuraceous, not prominently ridged on upper face: spadix much larger and more or less pendulous: fruit straight when mature and dry, 4 cm. or more long; seed globular, 2 cm. or more broad, deeply marked with raphal grooves, basal point short and abrupt and pointing to side. . . . . 2. *H. Vaughanii*

1. **Hyophorbe indica,** Gaertn. l. c. Figs. 42, 43, 44, 45, 46, 47, 48.

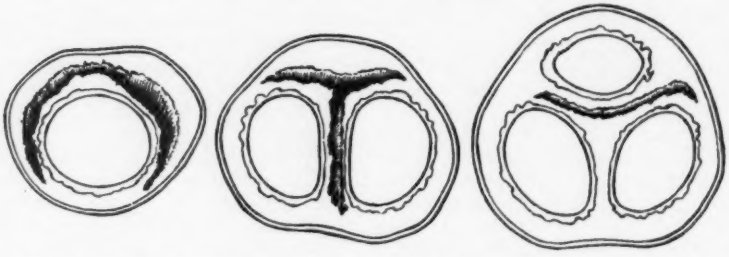
Areca lutescens, Bory, Voy. ii, 206 (1804), apud Martius et al.

Hyophorbe Commersoniana, Martius, Hist. Nat. Palm, iii, 164, tt. 143, 154 (1837).

Hyophorbe vilicaulis, Comm. ex Martius, l. c. as synonym but with Latin diagnosis and qualified to be taken up in case earlier names should fall.

Hyophorbe amaricaulis, Martius, l. c. 309 (1849), *nomen.*

Slender tree 10–16 m. tall, with prominently ringed not swollen or fusiform often leaning or crooked trunk, and thin head or coma of few leaves with blades spreading well above the conspicuous crown-shaft: leaf with cylindrical glabrous sheath 50 cm. or more long and terminated by a shorter petiole; blade 1–2 m. long, evenly and closely pinnate, the pinnæ 50 pairs more or less and attached by a narrow base within the sharp margin of the rachis, glabrous except for conspicuous light colored palea or chaff on main veins underneath, 50 cm. or more long, mostly 2 cm. or less broad, moderately or slenderly long-pointed, midrib and strong secondary rib either side of it very prominent and lighter colored underneath and the intermediate veins not conspicuous, the upper surface less differentiated in veining: spadix at base of crown-shaft, much branched beyond the jointed



40. CROSS-SECTIONS OF FRUITS of *Latania borbonica,* nearly full size, showing one, two and three seeds developing. Florida.

peduncle, divaricate or in fruit declined, the framework at first whitish in color, some spadices apparently all staminate and rachillæ more slender than those of the pistillates: fruit long-pyriform, 3–3.5 cm. long when mature and fresh and nearly or quite straight but when dry 3 cm. or less

41. Fruits and seeds of Latans, nearly full size: *a*, *b*, *Latania Loddigesii*, three fruits at top and two seeds underneath; *c*, seeds of *L. borbonica*; *d*, *L. Verschaffeltii*.

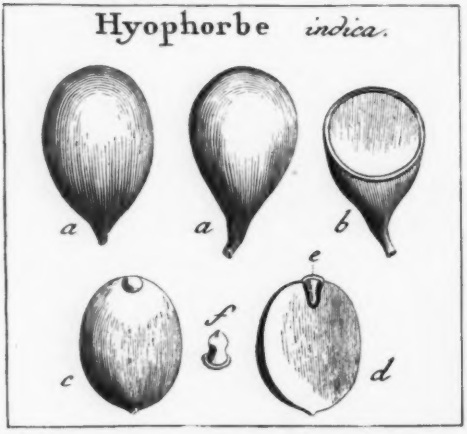
long and conspicuously curved or one-sided and warty; seed about 2.5 cm. long, 1.5 cm. broad near top, tapering to a sharp straight pointed base, raphal lines not deeply marked; position of embryo variable but above the middle of the seed.

Réunion, formerly known as Bourbon; a forest palm.

Martius displaced Gaertner's binomial, *H. indica*, with *H. Commersoniana*, without explanation, but probably because Gaertner's account was not satisfactory. Justification was not required in those days. He cites *H. indica* as a synonym. Some of the details in his picture of *H. Commersoniana*, t. 154, are not understandable to me, but I await further materials before analyzing them.

In the herbarium of Muséum National d'Histoire Naturelle in Paris are three sheets of *Hyophorbe indica*. Two of them bear specimens from Bourbon by Boivin and Commerson; the third is without locality although the same as the others and bears annotation by Martius that it is *Hyophorbe indica* Gaertn. and *Sublimia vilicaulis* Com. All these sheets represent the palm of which I have specimens from Réunion and which is intended in the foregoing diagnosis. The Muséum has provided me with two seeds collected on Bourbon in 1862 by M. Maillard and which correspond with those of *H. indica* in Fig. 48.

In the herbarium at Kew, England, is a sheet labelled *H. indica*, "Hort. Mauritius," that is apparently the same as those in Paris. The sheet bears a pencil sketch of the tree with analysis of flowers by W. Scott, made in August, 1884. I have flowers of *H. indica* from Réunion but the record is not clear and therefore I postpone analysis of them.



42. ORIGINAL PICTURE OF FRUITS of *Hyophorbe indica* by Joseph Gaertner who founded the genus in 1791. *a*, the entire fruit; *b*, in section; *c*, seed removed; *d*, seed cut vertically, showing embryo at *e*; *f*, embryo removed.

† 2. **Hyophorbe Vaughanii,** spec. nov. Figs. 48, 49.

Differt ab *Hyophorbe indica* præsertim his modis: pinnæ comparate latiores, sine paleis in venis principalibus inferioribus; rachis convexa in dorso, plus vel minus furfuracea, in facie ventrali sine acri carina centrali: spadix maxima,

rachillæ pendulosæ: fructus magnus, rectus, oblongus, 4–4.5 cm. longus, 3 cm. latus cum siccus, postea corrugatus sed non verrucosus; semen globosum, 2 cm. vel plus latum, non attenuatum ad basim, acumen breve et diagonale.

Distinguished from *H. indica* by pinnæ free of palea on under surface unless on midrib toward the base, relatively broader or shorter; rachis convex on back and more or less furfuraceous, the front face not bearing a sharp central ridge: spadix large and diffuse, the rachillæ usually hanging: fruit large, straight, oblong rather than pyriform, 4–4.5 cm. long and 3 cm. broad when dry and then puckered but not verrucose; seed globose, 2 cm. or more broad, not tapered, point short and sidewise near base.

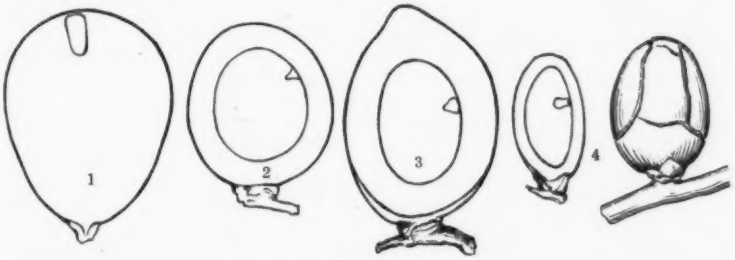
Mauritius. Dr. Vaughan sends me specimens from forest of La Gouardotte near Gouly, 1,800 feet, with the note: "Very rare in Mauritius. It is not cultivated and only one or two wild specimens are known." He writes me: "There is not the slightest doubt that the Mauritius palm called *H. indica* is another species quite different from the Réunion one." It is a pleasure to dedicate the species to him.

While these two Hyophorbes are probably natively confined to their respective islands, they may have been interchanged from early times by planters and travellers.

† 3. **MASCARENA,** gen. nov.

Affinis Hyophorbæ: a qua differt turgido vel ventricoso trunco leviter annulato, pinnis latis ad basim affixis diagonaliter et pæne adverse, floribus multo minoribus, antheris affixis ad filamenta triangularia quæ ad petala junguntur, fructibus minoribus, non pyriformibus et sine succulento et verrucoso sarcocarpio, semine testaceo, non libero, non separato a mesocarpio, embryone laterali.

Erect monœcious Mascarene palms distinguished from Hyophorbe primarily by tumid boles constricted in one part or another, and by the testaceous seeds that are attached inside a definite seed-shell or wall rather than free and loose within the dried exterior of the fruit: trunk only lightly annulate: pinnæ broad-based, placed diagonally and nearly or quite op-



43. FRUITS OF PLUM-NUT PALMS, to show a generic cleavage between Hyophorbe and Mascarena; mostly somewhat more than natural size. 1, *Hyophorbe indica;* embryo at top (but not uniformly so placed); note absence of seed-wall or testa. 2, *Mascarena Revaughanii;* 3, *Mascarena lagenicaulis;* 4, *Mascarena Verschaffeltii,* section and exterior.

positely but bases separated by a line or ridge lengthwise the rachis on upper side: anthers on triangular filaments that are attached on corolla: fruit not pyriform, without thick verrucose sarcocarp; seed not free but adherent to the thick seed-wall which, however, dries down in age to a thin covering, the raphal lines not prominent; embryo lateral at middle or above.—Mascarè-na, adaptation from the name of the archipelago where it is native.

Species 3, two of which are known to be native in the Mascarenes, the third probably also of that origin.

The segregation of Mascarena provides three Arecæan genera with minute asexual flowers arranged in single or two-rowed linear acervuli (shown in Fig. 50), the others being Hyophorbe of the Mascarenes and Synechanthus of Central America (for the latter, see Fig. 64 in Gent. Herb. iii, 83, 1933). The lowermost one or two or sometimes three flowers in the thin single or double line are pistillate. Even after the staminate flowers have fallen their places are marked by scars. The genus Gaussia of Cuba and Puerto Rico exhibits similar but not identical arrangement of flowers.

A. Trunk of tree at bearing age conspicuously narrowed into a slender or neck-like part below the inflorescence (this description does not mean the crown-shaft or *culmen superius*, which is above the inflorescence and is not solid stem or trunk but a cylinder of leaf-sheaths and the included terminal ascending bud), base of the bole thick and in low trees bulbiform: petiole 30 cm. or more long: pinnæ bearing a rib either side the midrib and nearly as prominent, particularly conspicuous on under side, closely placed on rachis and often more than 3 cm. broad: rachillæ or branchlets of inflorescence divaricate or in fruit deflected but not hanging prone: fruit thick, more than one-half as broad as long, 18 mm. or more in length when fresh.

B. Rachis of leaf (at least in upper half) without dividing line or ridge, bases of opposing pinnæ extending past each other: spadix 40–50 cm. long: rachillæ crooked and short, 8–10 cm. long: number of flowers 5 or less in each line: fruit 20 mm. or less long.....1. *M. Revaughanii*

BB. Rachis of leaf provided with a lengthwise ridge on upper side that separates the two rows of pinnæ bases, the bases themselves much expanded: spadix 60–75 cm. or more long, very diffuse: rachillæ straight, mostly 12 cm. or more long: number of flowers in each line 6 or more: fruit when mature and fresh 25 mm. long.....2. *M. lagenicaulis*

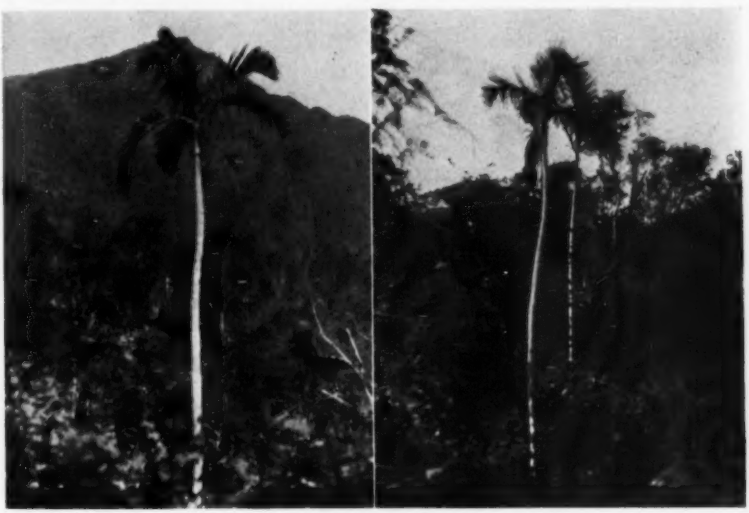
AA. Trunk not bottle-necked up to the inflorescence, but usually narrowed in some of its length below that part (this is independent of the crown-shaft above the inflorescence): petiole 10 cm. or so long: pinnæ not 3-ribbed, the side nerves little noticeable, separated on rachis and narrow, mostly less than 3 cm. broad: rachillæ hanging prone and limp at fruiting time: fruit about one-half as broad as long, not exceeding 15 mm. long when fresh. .....3. *M. Verschaffeltii*

† 1. **Mascarena Revaughanii,** nom. nov. Figs. 30, 43, 51, 52, 53, 55.

Hyophorbe amaricaulis, Balf. f. in Baker, Fl. Mauritius & Seych. 383 (1877), not Martius.

Tree to 15–18 m., with heavy essentially erect often curved trunk perhaps oblique at base, tumid in the lower part where it may attain thickness of 60–70 cm., then gradually tapering upward into a very long slender apex

that bears the flower-clusters and above which is the smooth crown-shaft (*culmen superius*), the bole more or less obscurely ringed: leaves few, horizontal or only eventually drooping, often only 4 and assuming a cruciform position; petiole evident, to 30 cm. or so long and continuing as a prominent rachis; pinnæ closely placed, 50 or more pairs standing in an upright position so that the blade is trough-shaped, 60–75 cm. long and 3.5 cm. or less broad, tapering to long points except some of the terminal ones, smooth and glabrous unless for palea or scales on ribs underneath, midrib and two side ribs nearly equally prominent and lighter colored when dry, the intermediate veins many and very fine, bases of pinnæ somewhat expanded and those on opposite sides extending past each other so that a straight line on the rachis does not divide them: spadix infrafoliar, at top of true trunk and at base of crown-shaft, about 50 cm. or less long, rachillæ or ultimate branchlets short and usually wavy or crooked, mostly 12 cm. or less long and not dependent unless irregularly under weight of ripe fruit, the simple lines or clusters (acervuli) bearing about 5 flowers; spathes several tightly-fitting pointed bracts that fall before fruit matures: flowers about 5 or 6 in each line or acervulus on rachis, about 2 or 3 mm. diameter or the staminates 4 mm. across if expanded, the 3 petals spreading or reflexed in anthesis and bearing the 6 short-anthered stamens midway, pistillode columnar in the flower-cup: fruit globular-oblong, 18–20 mm. long and nearly as broad, black (sometimes yellow), glabrous, the soft exocarp eventually drying into a very thin wrinkled coat adherent to the seed until weathered away; seed 15–16 mm. long, very dark brown, marked on all sides by slight raphal grooves that make a similar but not identical pattern on all specimens; embryo lateral just above the middle, in very hard homogeneous white or blue-white albumen.



44. WILD NATIVE TREES of *Hyophorbe indica*. Island of Réunion. Trees about 32 feet tall.

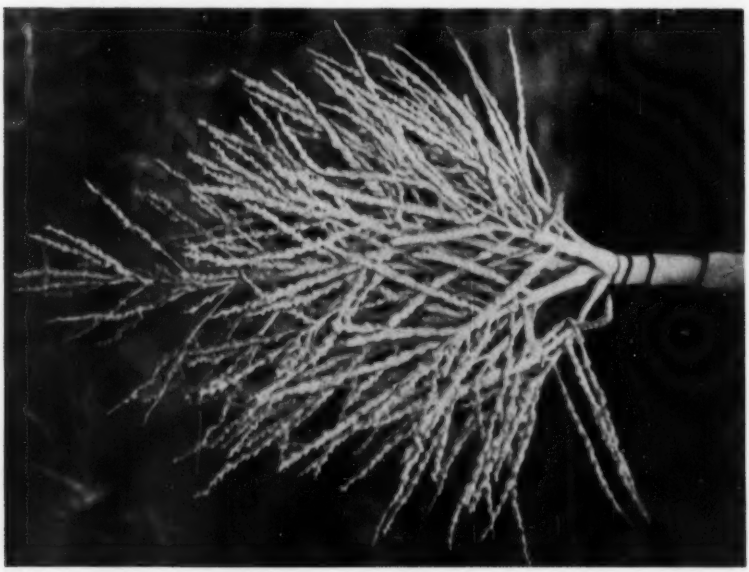
Round Island; planted on main island of Mauritius itself. I have not seen this species in cultivation in the western hemisphere. The diagnosis of this interesting palm is drawn from specimens, notes and photographs supplied me by Dr. R. E. Vaughan, of Mauritius, No. 807, Herb. Bailey.

† 2. **Mascarena lagenicaulis,** spec. nov. Figs. 43, 50, 54, 55, 56, 57.

Hyophorbe amaricaulis, Hort.; Auth. in part.

Truncus lageniformis, infra tumidus et angustatus ad inflorescentiam, culmen superius longum prominensque: pinnæ erectæ vel ascendentes, contiguæ, latis basibus separatis in rachide carina longitudinali, 40–60 cm. longæ, 4 cm. vel plus latæ, superficies punctata, 3 costæ, apices aliquanto breves; petiolus 30 cm. vel plus longus: spadix 60–75 cm. longa, multum ramosa et diffusa; rachillæ plerumque 12–14 cm. longæ, rectæ: flores 6 vel plures in acervulos elongatos dispositi: fructus ovoideus, 25 cm. longus, 15–18 mm. latus, glaber, ater; semen 20 mm. longum, irregulariter sulcatum, embryon laterale et supermediale, albumen durum et homogeneum.

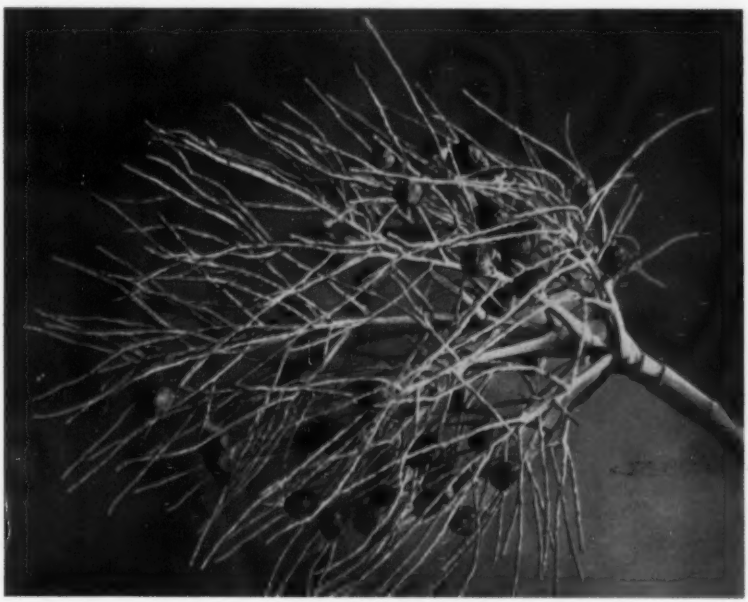
Stout erect palm of low stature as far as known (perhaps 3–5 m. tall) with thick tumid closely ringed bole that rather suddenly constricts into a short bottle-neck beneath the inflorescence: head of few stout bold leaves that may be disposed in a cruciform pattern, the stiffish pinnæ standing upright and disclosing the stout rachis or midrib underneath, crown-shaft



45. FLOWERING SPADIX OR INFLORESCENCE of *Hyophorbe indica.* Réunion. Much reduced.

(above the fruit-cluster) prominent; petiole 30 cm. or more long, convex on back, bearing a ridge or line on the rachis that separates the pinnæ even to the apex of the blade; pinnæ many, closely placed particularly toward the top, central ones 4 cm. or even more broad at middle and 40–60 cm. long, point not very long and slender but entire, surface above more or less punctate and dull in color, underneath bearing flecks or palea on the 3 very strong ribs but glabrous on the many fine ribs, the upper 36–40 cm. of the blade closely set with broad short and abruptly pointed pinnæ that are much expanded at base but separated in attachment by central line of the rachis, the terminal pair joined and perhaps not more than 10 cm. long: spathe comprised of several short close-fitting bifid valves or bracts that detach at anthesis; spadix to 75 cm. or more long, bushy-branched, glabrous, spreading in all directions but the branches variously deflexed in fruit, ultimate rachillæ or branchlets straight and 8–14 cm. long, and flowers usually 6–8 in somewhat double lines or acervuli; flowers very small, the staminates not more than 5 mm. across at anthesis, stamens 6 with short upstanding anthers attached below the lobes of the corolla: fruit ovoid, about 25 mm. long and 15–18 mm. broad, glabrous but somewhat rugose, black at maturity, the floral envelope not greatly enlarged; seed 20 mm. long more or less, the surface marked with raphal grooves; embryo lateral, somewhat above the middle, in plain hard albumen.

Nativity not distinguished, presumably Mascarene and overlooked



46. Fruiting spadix of *Hyophorbe indica*. Réunion. Reduced.

there. It is frequent in cultivation in the western hemisphere from southern Florida to Rio de Janeiro; fragmentary specimens from Singapore appear to be the same. The specific name is from Latin *lagena*, flask or bottle, and *caulis*, a stem.

It is apparently not known what stature this palm attains, or whether in age it develops such a long slender trunk or neck as seen in Fig. 30 representing *M. Revaughanii*.

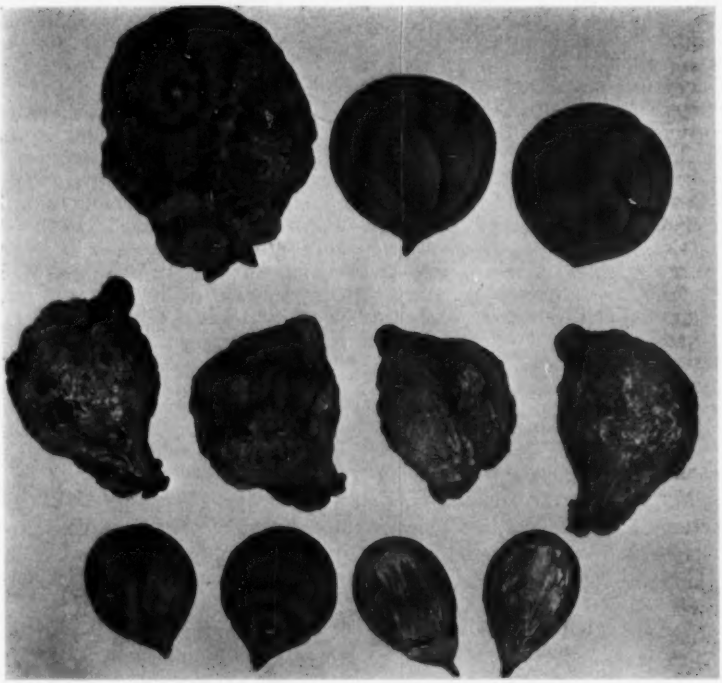
Type of *Mascarena lagenicaulis* is material in Herb. Bailey from the Montgomery plantations, Coconut Grove, Florida, No. 716, all from one tree.

† 3. **Mascarena Verschaffeltii,** trans. nov. Figs. 43, 50, 58, 59, 60.

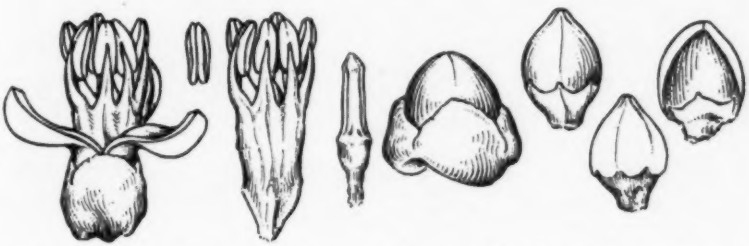
Hyophorbe Verschaffeltii, Wendl. in Ill. Hort. xiii, sub. t. 462–3 (1866); Balf. f. in Baker, Fl. Mauritius & Seych. 383 (1877).

Strictly erect tree, 6–10 m. tall, the bole not contracted to the inflorescence or much swollen at base but usually constricted at the middle, tumid where the flowers and fruits are borne, head of many curving leaves on which the pinnæ are diffuse and some of them drooping, lacking the stiffness and ascending direction of the foliage of *M. Revaughanii* and *M. lagenicaulis:* leaves 2 m. long more or less, petiole only 10–12 cm. long, broad, flat above but at the blade developing a bordered groove or valley on upper

47. MATURE FRUITS of *Hyophorbe indica*, sent fresh in liquid from Réunion. Natural size. When these fruits are dried at Ithaca they assume irregular shapes of those in middle row in Fig. 48.



48. FRUITS AND SEEDS of the two Hyophorbes, natural size; photograph of dry material directly from the Mascarenes. Top, a fruit and two seeds of *Hyophorbe Vaughanii*. Middle, fruits of *Hyophorbe indica*, and bottom row seeds of same.



49. STAMINATE AND PISTILLATE FLOWERS of *Hyophorbe Vaughanii*, × 4; open flowers × 6. Mauritius. Separates show an anther and pistillode.

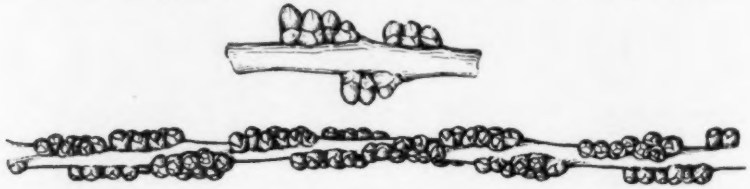
side that becomes a central sharp ridge on the rachis, rounded or convex on the under side; pinnæ more than 50 pairs, nearly opposite or somewhat staggered, separated 1–2 cm. on the rachis, base expanded but not flattened, 30–50 cm. long and 2–3 cm. broad, narrowly long-pointed, glabrous unless flaky on the rib underneath, midrib prominent on both sides and many fine nerves but no strong side-ribs, apical pinnæ conspicuously narrow: flower-clusters borne on the bulge at apex of trunk and base of stout long crown-shaft, often several of them at the same epoch from the elongated spathal stage or bud to open flowers and fruits, the brush-like projecting stoutly peduncled flowering spadix 75 cm. or more long, the many slender rachillæ hanging in fruit: flowers in short lines or acervuli on the rachillæ, small, the staminates 4–5 mm. across when expanded; stamens 6, attached at center or toward base of petals, anthers twice or more as long as broad, pistillode columnar and not prominent: fruit oblong to short-cylindric, 12–18 mm. long and 8 mm. thick, blunt at apex, black, glabrous, persistent envelopes at base not much developed, sarcocarp thin and watery, adherent to the seed along at least one side; seed cylindric-pointed, about 10–12 mm. long and one-half as broad, brown, with faint raphal lines; embryo lateral about midway, in plain and hard albumen.

Rodriguez. Frequent in cultivation southern Florida to Rio de Janeiro, a handsome shapely tree; I have it also from Singapore.

My adoption of the name *H. Verschaffeltii* is based mostly on the fruit pictured by Wendland and Lemaire rather than on full acceptance of the colored plate and the description. This is probably the *Raphia vinifera* figured by Descourtilz in Flore Pittoresque, second edition (1833) as growing in the Antilles.

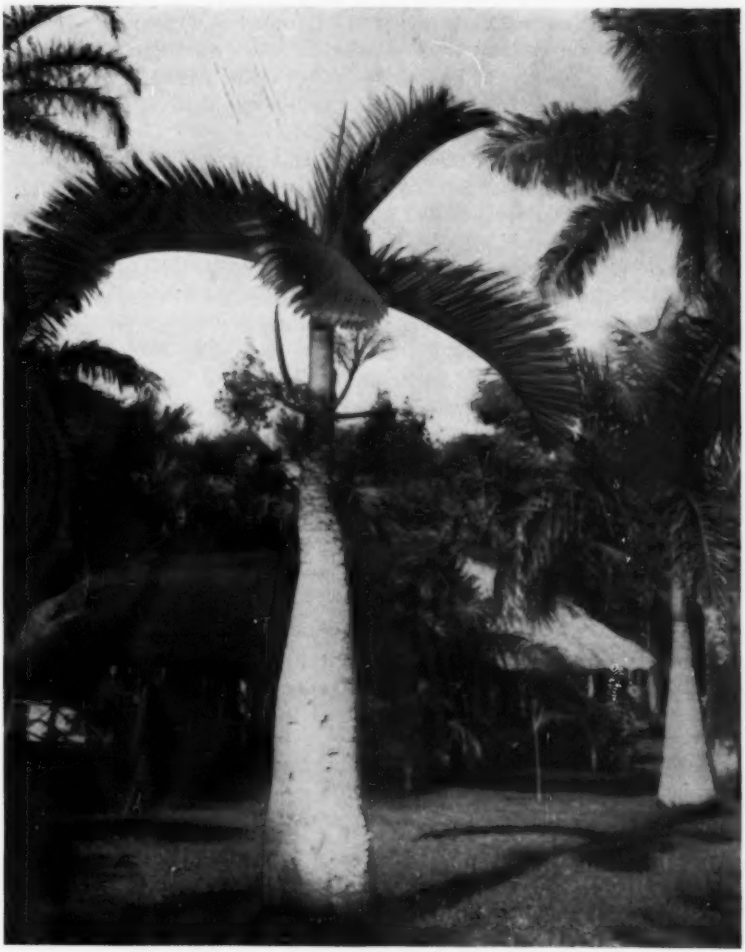
Now we may recount the interesting but devious botanical history of the plum-nut palms.

The botanical nomenclature (pronounced nò-menclature, accent on the first syllable) begins with Joseph Gaertner (1732–1791) in the second volume of his scholarly De Fructibus et Seminibus Plantarum published at Tubingen, Germany, in 1788 and 1791. Gaertner prepared two volumes, in Latin, describing the fruits and seeds that had been assembled by collectors



50. Linear acervuli or flower-clusters of *Mascarena Verschaffeltii* above, and of *M. lagenicaulis* below. Nearly twice natural size. Each acervulus or little heap has a pistillate flower or two at base. Above, the acervulus has flowers in single row; bottom, more or less in two rows.

and travellers, representing all kinds of plants, even when he may have had no knowledge of their native countries. Often he founded new genera and species without knowing anything about the plant itself, and sometimes cited old pictures and early Latin names for them that we now know belong to wholly different subjects. Thus we are likely to be confronted at



51. Good fruit-bearing tree of *Mascarena Revaughanii*, with long-tapering bole and narrow crown-shaft. Sometimes erroneously known as *Hyophorbe amaricaulis*. Mauritius, planted.

once with a question of identification and with the elimination of inapplicable synonyms. One of the confusions is in Euterpe of Gaertner, a genus of attractive tropical American palms which was based by him on fruits or nuts of which he did not know the origin. This case has been often discussed and different conclusions have been reached as to the application of the name. I reviewed the question in Gentes Herbarum in 1940 (iv, fasc. x, 377).

Gaertner established the generic name Hyophorbe, with a single species, *H. indica*. He did not say it was a palm or ascribe an origin except as he writes the line "*Palmier de l'isle de Bourbon*" on the authority of the illustrious Paul Hermann, 1640–1695, who wrote extensively on plants. Bourbon is now Réunion, and is one of the Mascarenes.

Although Gaertner described only the fruit and seed of his *Hyophorbe indica*, not knowing the plant, yet his picture, reproduced in Fig. 42, determines the identification. There has been doubt about this picture, but fresh fruits from the wild in the Mascarenes of *H. indica* show the shape and apical embryo, even though the surface markings are omitted in the cut. The picture is accurate enough to show the seed without a seed-wall or testa, as one soon observes in sectioning the fruit. The picture is as good as many others of that period. I accept the picture as *H. indica*, unless further explorations clarify the case, and technical description of the species is provided in the preceding pages. The species has not been well differentiated from Gaertner's day to this, and study of it in the field is required; but I trust the present account may remove some of the misinterpretations.

The next botanical event in this connection is the publication of the palm *Areca lutescens* by Bory de St. Vincent in the second volume of Voyage dans le quatre principales iles des mers d'Afrique in 1804. This species was known as "the poison palm" because of the bitterness of the "cabbage" or terminal bud (which takes on a yellow color, whence the name *lutescens*) but Bory states that the native women (les femmes créoles) eat the cabbage without harm.

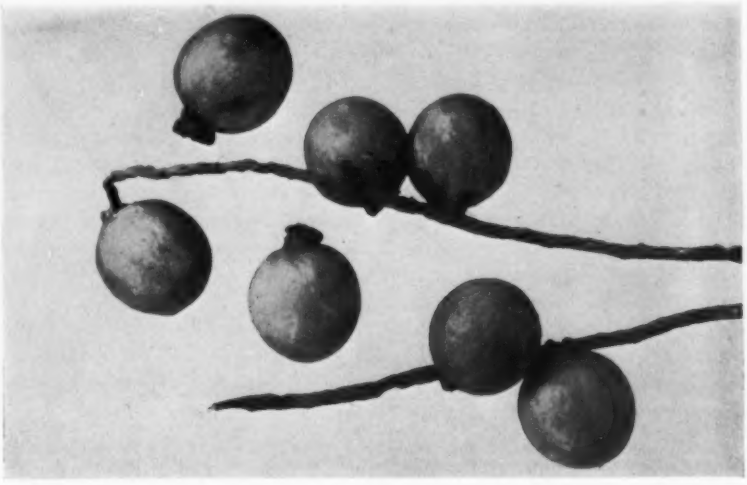
Before Bory's time, however, Philibert Commerson had been in the Mascarenes. A note about him is printed on one of the former pages (64). He left manuscripts from which some of our knowledge and names of plants

52. Staminate and pistillate flowers of *Mascarena Revaughanii*, about six times natural size except the pistillode near right which is nearly twelve times enlarged.

have been derived: we met him, for example, in connection with the nomenclature of Lodoicea in the Seychelles paper. In 1849 Von Martius, the first great student of palms, listed a palm from Mauritius without description on the authority of Commerson under the name *Hyophorbe amaricaulis:* the name itself was probably also suggested by Commerson. The word *amaricaulis* means "bitter stem"; undoubtedly Commerson had heard reports of the bitterness of the terminal bud, as had Bory at a later time. Commerson's name *vilicaulis* (Latin *vilis*, vile) probably has similar connotation.

It is commonly agreed that *Hyophorbe indica* of Gaertner and *Areca lutescens* of Bory are the same palm; *Hyophorbe amaricaulis* of Martius is presumably the same as Bory's poison or bitter palm.

The first botanists to take up and describe *Hyophorbe amaricaulis* as of Martius were Wendland and Lemaire in Verschaffelt's L'Illustration Horticole in 1866, with colored plate. Wendland was responsible for the nomenclature and Lemaire for the popular description. Wendland applied the name *Hypohorbe amaricaulis* to a very different palm, the identity of which is more or less determinable only by the picture of the seed, and this is none too good; picture of the virgin *amaricaulis* plant in L'Illustration shows soft drooping long-pointed pinnæ such as the plant that supposedly bears the seed does not possess. The young tree, in the picture, shows no evidence of the tumid trunk of the plant we at present call *Hyophorbe amaricaulis*. Under these circumstances, the identity of the plant Wendland intended by the name *amaricaulis* remains at least in doubt, and I do not



53. Fruits, seeds not yet fully ripe, of *Mascarena Revaughanii*. Mauritius. × 1.

indicate it in synonymy. The name is consistently used otherwise by horticulturists and the confusion cannot be halted by redefinition of it.

The first clear dependable diagnosis of *Hyophorbe amaricaulis* is by Balfour in Baker's Flora of Mauritius and the Seychelles, 1877. I conceive this is not the palm intended by Commerson and by Martius as *amaricaulis*, and perhaps not the one described by Wendland and Lemaire. In fact, Wendland or Lemaire himself calls attention, in a foot-note, to the ineptness of the word *amaricaulis* for his palm, stating it is not the stem but the cabbage that is *amère* or bitter, or poisonous, indicating that he took up the Martian name without evidence of its application. This explanation relieves me of the embarrassment of trying to understand the reason for the name *amaricaulis*, seeing that we are not in the habit of chewing the trunks of palm trees to discover their taste.

Wendland was in doubt as to the identity of Bory's *Areca lutescens*, apparently because he had not seen Bory's account. He cites description from Sprengel in the Systema that the pinnæ were plicate and premorse (præmorsus, bitten off or jagged), but this was an innovation by Sprengel (really by Willdenow in 1805), not occurring in Bory. Perhaps Sprengel had in mind a palm different from Bory's. See Linnæus, Systema Vegetabilium, 16th edition, by Sprengel, ii, 139 (1825).

Wendland recognized inharmony in the genus Hyophorbe by proposing subgenera Euhyophorbe and Gonophorbe, the latter to designate *H. Verschaffeltii*, then added. In dividing the old genus Hyophorbe, making two of it, I have proposed the new name Mascarena, not raising Gonophorbe to generic rank as I should have been obliged to redefine it so radically as to have destroyed its significance.

We have not yet resolved the difficulties attending the nomenclature of these plum-nut palms and their relatives. I now have in mind the common commercial and parlor palm known as *Chrysalidocarpus* (or *Areca*) *lutescens*.

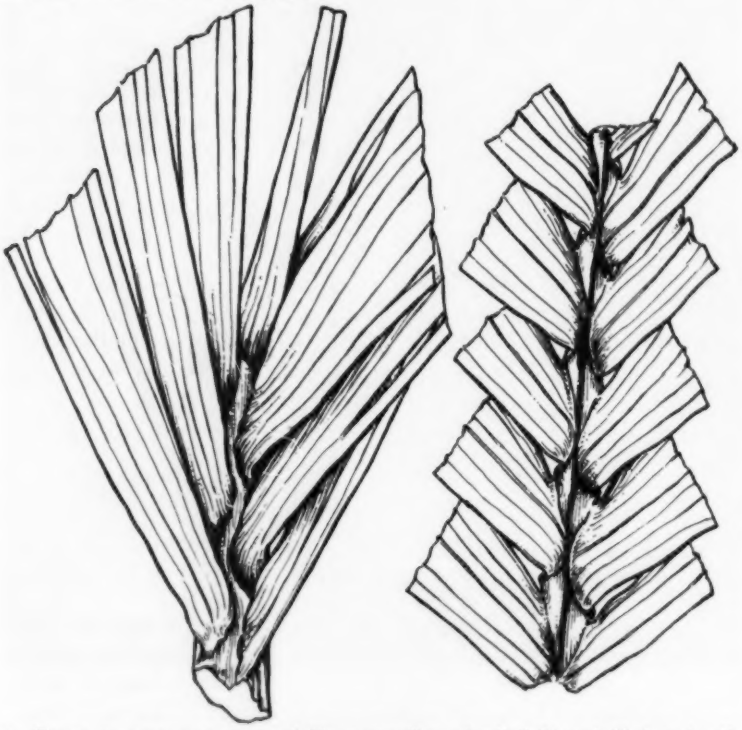
We have noted that in 1804 Bory de St. Vincent published *Areca lutescens*. The word *lutescens* means yellowish or, more strictly, becoming yellow. The name was applied to his palm because the "cabbage" or great terminal bud takes on a yellow color. Hermann Wendland, the great palm authority of Hanover, Germany, and who gave particular attention to the horticultural kinds, listed *Areca lutescens* as in cultivation in 1854 (Index Palmarum, 24).

By 1878, however, Wendland had become convinced that the plant in the glasshouses of Europe as *Areca lutescens* was an undescribed species (Botanischer Zeitung, xxxvi, 116). He writes (to translate freely):

"Amongst the palm seeds sent to me repeatedly for determination is the beautiful room-palm loved for many years and cultivated in Europe for at least 50 years, which passes as *Areca* or *Hyophorbe indica* or *lutescens*, also

54. CHARACTERISTIC TREE IN BEARING of *Mascarena lagenicaulis* in southern Florida, commonly known as *Hyophorbe amaricaulis*. It has a shortly tapering bole and stout crown-shaft.

as *Areca borbonica* or *A. Dicksoni*, and is strikingly distinguished by the beautiful yellow white-frosted and dark-brown spotted leaf-sheaths and leaf-stalks and the dark violet undeveloped leaves. Not even the place of its origin is known certainly; however it originated in Madagascar or the Mascarenes, and in the latter case the island of Bourbon for according to Balfour it does not occur in Mauritius. As its common occurrence in European gardens often causes confusion with *Hyophorbe indica*, Gaertn., so I do not hesitate, according to the well illustrated fruits lying before me, to describe as new this genus related to Hyophorbe, for which I propose the name *Chrysallidocarpus*, since most of the fruits before me bear the greatest resemblance to butterfly pupæ because of the spotted mesocarp being divested of the epidermis." (Wendland prints the name with a double *l* in this preliminary discussion, but as Chrysalidocarpus in the formal account on his succeeding page).



55. CONTRAST OF PINNÆ BASES of *Mascarena Revaughanii* (left) and *M. lagenicaulis* (right), nearly natural size. Note the overlapping bases on left and those separated by a ridge or keel on right.

Although Wendland did not illustrate his *Chrysalidocarpus lutescens*, there is no reason to doubt the palm he meant to typify, which is now known to be native on Madagascar and is one of the commonest palms in house decoration. It is a clustered palm, producing many stems. The leaf-sheaths are provided with a white bloom-like covering and many irregular purplish flecks or marks; these marks extend for a distance up the petioles, but may not be conspicuous in plants grown in too much shade and are likely not to show in dried specimens. Petioles and ribs of young leaves have a pleasing yellowish color.

Thus came the name *Chrysalidocarpus lutescens* for the cultivated palm, although known to this day among growers as *Areca lutescens*. Wendland continued the name *lutescens* that he found on cultivated plants although the name had been applied, no doubt, from the very different *lutescens* of Bory. It would appear that Wendland got his color suggestion from leaf-sheaths and leaf-stalks whereas Bory had his suggestion from the terminal bud or cabbage.

It is not allowable to apply a name to a species other than that for which it was originally intended, and particularly not to transfer it in formal publication. Yet nowhere does Wendland quote or cite Bory in connection with this garden palm. We may assume that he merely continued the use of a floating unidentified name when placing it in a new genus and did not undertake to transfer the Bory name to another palm. There may have been no confusion. He establishes a new genus and a new species. We have the right to a *lutescens* in more than one genus in case we do not illegitimately apply one man's publication to different plants and therefore confuse the literature and record. Therefore I adopt *Chrysalidocarpus lutescens*, Wendland, for the cultivated palm even though I regret the duplication of names. It would be practically impossible at this late day to dislodge *lutescens* from horticultural practice.

DICTYOSPERMA—THE PRINCESS PALMS

A set of pinnate-leaved and spineless Mascarene palms is common in cultivation from southern Florida through the American tropics. They may be identified by Fig. 61.

These are attractive trees with single ringed trunk, arching or drooping long leaves, stiff or clumpy flower- and fruit-clusters on the bole beneath the head and at the base of a long crown-shaft, and small black or purple cartridge-shaped fruits. They are as hardy as coconuts and easy to cultivate. They have had no name in English until in Hortus Second I called them the princess palms. Botanically they are Dictyospermas, but the

nomenclature is none too clear. The names recognized by planters are *album*, *rubrum*, *aureum*, *furfuraceum*. We now undertake to determine what these names mean. Some of the discussion may be technical but nevertheless essential to understanding.

The first authentic botanical account of the princess palms appears to be that of Bory de St. Vincent in the first volume, 1804, of his famous Voyage dans les quatres principales iles des mers d'Afrique; here he describes *Areca alba*, unarmed palm with glabrous petioles. The palm he describes had bright green leaves when young with the nerves attractively red. This would seem to indicate he had the palm we have known as *Dictyosperma rubrum* although the other marks of that species are not indicated; and he really meant to designate a white palm else he would not have called it *Areca alba*. Bory does, indeed, describe an *Areca rubra* as well as *A. crinita* in this volume, but these are spine-bearing palms and belong to our present genus Acanthophœnix.

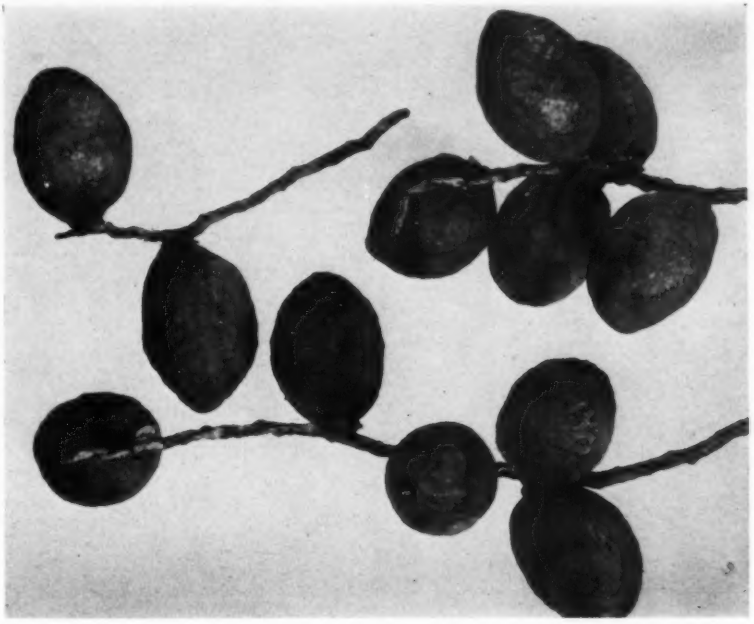
In 1875 Hermann Wendland and Oscar Drude in Linnaea founded the genus Dictyosperma for a species of palm in "Insulæ Borboniæ et Franciæ," that is, on Bourbon which is now Réunion and Mauritius once Île de France. They based the genus Dictyosperma on the *Areca alba* of Bory de St. Vincent, but they do not make the binomial *Dictyosperma album*, as commonly cited. That combination appears first in 1877 by Balfour in Baker's Flora of Mauritius and the Seychelles on his interpretation that the names were intended to be put together in Linnaea; the binomial appears again in 1878, by Wendland in the Index Général of Kerchove, Les Palmiers, by the citation of *Areca alba* of Bory, but he cited "Wendl. et Dr." as authority. The specific name was properly placed in the neuter, *album*, by Wendland, to correspond with the gender of the Greek Dictyosperma, although many subsequent authors, including Balfour and Beccari, have treated the generic name as if feminine (*D. alba*).

In the same Index Général, Wendland makes the name *Dictyosperma rubrum*, but he is careful not to cite Bory's binomial but rather "Areca, Hort." In fact, the name *Dictyosperma rubrum* is not valid in the Index

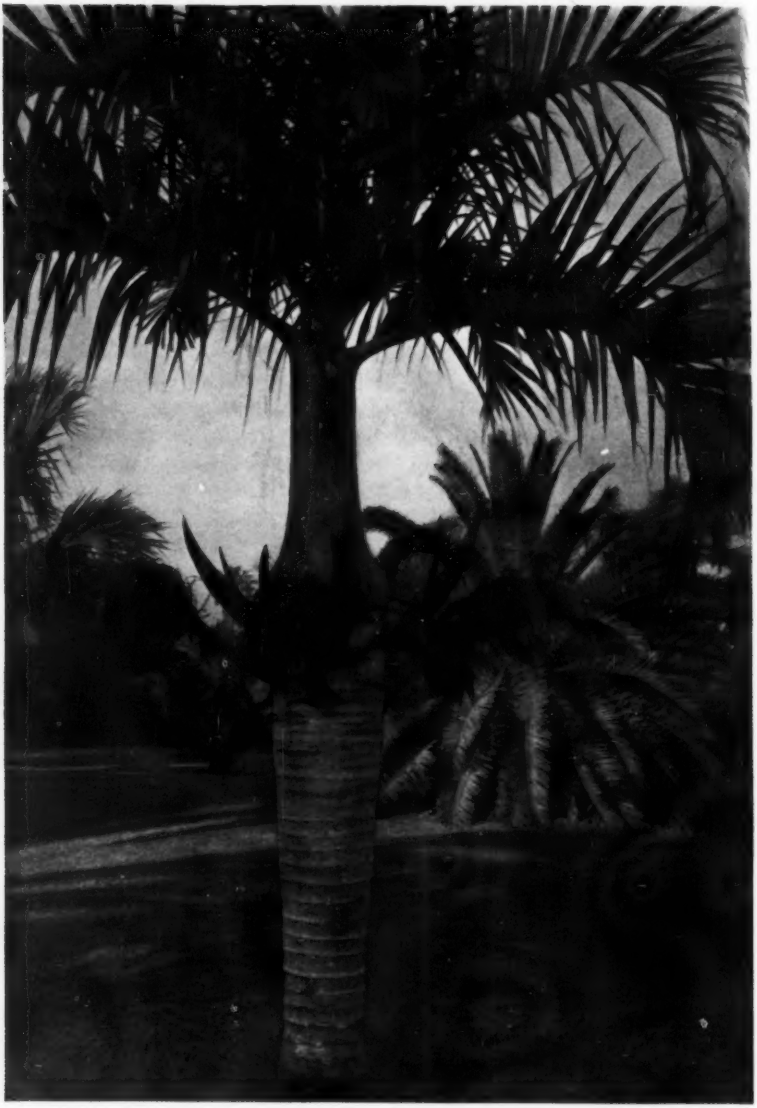
56. Staminate and pistillate flowers of *Mascarena lagenicaulis*, × 4. Separate stamens and a pistillode are shown.

Général inasmuch as there is no diagnosis or citation of a published binomial behind it (Rules, Art. 44). The same may be said of the binomial *Dictyosperma aureum*, but in this case there would be no confusion with names of Bory. In 1878 Wendland and Drude had listed *Dictyosperma aureum* in Kerchove's Les Palmiers but only as a *nomen nudum*, that does not hold in nomenclature. Under date 1877, Isaac Bayley Balfour, writing the palms of Mauritius, enters in a subordinate position as one of "the principal forms" of *Dictyosperma alba* the binomial "*D.* (*Areca*) *rubra*, Hort." and also "var. *aurea*, Balf. f." with the synomym *Areca aurea*, Hort. Preceding Balfour's var. *aurea* is a subordinate entry *D.* (*Areca*) *furfuracea*, and Beccari interprets this circumstance (apparently erroneously) as publication of *D. furfuracea* var. *aurea*.

If we cite Wendland and Drude as authority for *Dictyosperma rubrum*, we must assume they had in mind the palm later named "*D. rubra*, Hort." by Balfour, but the record is lacking. Under these circumstances, it is safest to cite *D. rubrum*, Balf. f. even though Balfour evidently did not regard the palm as a separate species, and to find another authority for *D. aureum*.



57. Full-size fruits of *Mascarena lagenicaulis*, commonly known to planters as *Hyophorbe amaricaulis*. Southern Florida.

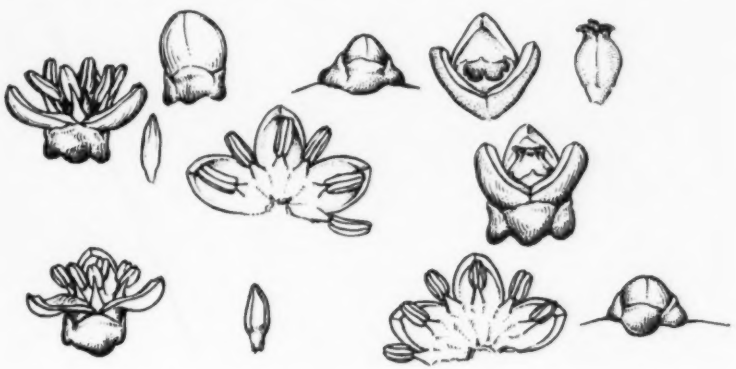


58. TREE COMING INTO FLOWER of *Mascarena Verschaffeltii* in southern Florida. Note the bulge at the top of the bole, and the crown-shaft above the flower-clusters. Some of the spathes are not yet open. Heretofore known as *Hyophorbe Verschaffeltii*.

There has been variable opinion whether Dictyosperma is one species, or two or three. Usually the palm is known as *D. album*, with varieties *rubrum* and *aureum*. In his final treatment of the Areceæ Beccari accepted three species, *D. alba*, *D. aurea*, *D. rubra*, as well as *D. alba* var. *furfuracea*, all of the Mascarenes. The Madagascarian *D. fibrosum* of Wright is *Vonitra fibrosa*, Becc. (La Sinonimia delle Palme Gerontogee della Tribù della Areceæ in Nuovo Giornale Società Botanica Italiana, xlii, 1935; posthumous).

If search were made for a generic name to supplant Dictyosperma one's attention would be arrested by Martius' quotation of *Sublimia palmicaulis* in his account of *Areca rubra* in Historia Naturalis Palmarum, ii, 175 (1837). The Sublimia binomial is cited from a manuscript of Commerson and is therefore only a *nomen nudum* in synonymy. The unpublished Commersonian concept of Sublimia must have been very broad, inasmuch as Martius cites binomials under it for the Hyophorbe species as well also as for *Areca Cathecu*.

In 1915 O. F. Cook was attracted by a palm growing in the garden of the plaza at Payta in Peru. He made a study of it and collected material. When the seeds were later examined in Washington they "seemed to be the same as those representing *Dictyosperma album* (Bory) in the collections." He noted the generic name Dictyospermum by Wight in 1853 for a plant in the Commelinaceæ and Dyctisperma by Rafinesque in 1838 for a genus now merged in Rubus, and he considered these names to invalidate Dictyosperma for the palm and proposed a new name, Linoma; under current practice in nomenclature in conformity with the Rules, however, these old generic names are not in conflict merely because they are similar, and therefore I cannot adopt Linoma.



59. Flowers in both sexes, with two separate pistillodes, of *Mascarena Verschaffeltii*, × 5. The lower line (at bottom) represents flowers grown in southern Florida; upper items are flowers from Mauritius; they compare very well.

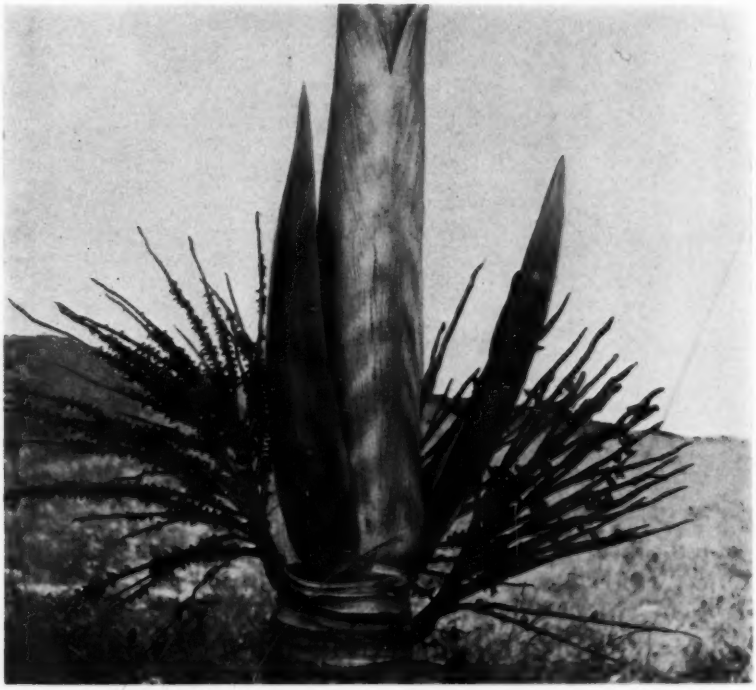
Cook had doubts also as to the proper application of the name Dictyosperma of Wendland and Drude. "Thus the problem is not merely to find a name that can be used in place of Dictyosperma, if this be rejected as a homonym, but to have a generic designation that is more definitely applicable to the palm current in the horticultural world as *Areca alba* or *Dictyosperma album*. . . . These possibilities of further confusion may be reduced by considering the specimens collected at Payta as type material of a new genus, for which the name Linoma is proposed." He continues, "The generic name alludes to the fine, compact texture of the fibrous mesocarp layer of the fruit." Full publication was made in the Journal of the Washington Academy of Sciences, vii (1917), in an article entitled "The Mascarene cabbage palm as a new genus." Typification of the princess palms on this basis would thereby be transferred from the Mascarene islands to Peru.

60. Fruiting parts of *Mascarena Verschaffeltii*. At left, the trusses hanging from the tumid bole, and a spathe not yet open. At right, the fruits about three-fourths natural size. Southern Florida.

61. HEAD OF PRINCESS PALM in flower, the spathes having fallen. *Dictyosperma album*. Mauritius. Some of the leaves are injured by a chrysomelid moth.

It is impossible yet to reach a definite conclusion whether *rubrum* and *aureum* are variants of *album* or are really distinct species. One is hardly safe in forming opinions on the plants in cultivation inasmuch as the authenticity of them is not established and as they may be hybrids or other variants. However, the following treatment may be adopted until the subject is newly investigated in the original islands.

My correspondent on Mauritius, R. E. Vaughan, writes me that he thinks *Dictyosperma album* and *D. rubrum* are variants of one species but that *D. aureum* from Rodriguez is distinct. He writes: "The names *album* and *rubrum* refer solely to the venation of the young leaves but, the flowers of *D. album* being reddish-yellow and those of *D. rubrum* pale yellow or white, the names are frequently interchanged by horticulturists."



62. INFLORESCENCE OF PRINCESS PALM at base of crown-shaft in axils of fallen leaves. Two erect yet unopened spathes are shown. Spadix at left is in bloom, at right in fruit. *Dictyosperma album*. Southern Florida.

4. **DICTYOSPERMA,** Wendl. & Drude, in Linnaea, xxxix, 181 (1875); Hook. f. in Benth. & Hook., Gen. Pl. iii, 890 (1883). PRINCESS PALMS.

Linoma, O. F. Cook, in Journ. Wash. Acad. Sci. vii, 123 (1917).

Monœcious erect single-trunk medium or tall unarmed trees with closely ringed bole from an expanded base, bearing an attractive head or coma of long pinnate leaves from a crown-shaft at the base of which arise the short spadices: leaves arching or becoming horizontal, bearing many pairs of closely placed long-pointed spreading or drooping pinnæ that are bifid at apex, petiole with long expanded sheathing base in the crown-shaft but the horizontal part short: inflorescence short-peduncled, with many simple branches that at first ascend and then may become divaricate or drooping, the parts or rachillæ stout and densely flowered; spathes 2, flat, papery, soon deciduous: flowers unisexual, typically in 3's with the pistillate between but more or less irregularly placed at base and apex of rachilla, the apex being staminate so that the fruits are borne on the lower half or two-thirds of the strand; staminate flowers oblong-conic in mature bud, 3 sepals small, 3 petals prominent and valvate; stamens 6, with large anthers; pistillode small, less than the filaments, minutely 3-dentate; pistillate flowers short or nearly globular, petals exceeding sepals and closely imbricate over the pistil; stigmas 3; staminodes very small: fruit at maturity 20 mm. or less long, broad-elliptic to narrow-ovoid to nearly fusiform, narrowed at either end and particularly at apex, purplish, with thin exterior pulp soon drying; nutlet covered with thin fine reticulating fibers; seed single, with erect basal embryo and strongly ruminate albumen.

Pinnæ with very strong secondary veins and long-tapering points: spadix spreading to drooping, rachillæ with elongated pits after flowers have fallen: staminate flowers just before anthesis 7–8 mm. long.....1. *D. album*

Pinnæ with indistinct secondary veins (when fresh) and the central and apical ones on the blade short-pointed: spadix few-branched and erect or strongly ascending, denuded rachillæ with small nearly circular pits in which the calyx-cup may persist: staminate flowers 5–6 mm. long.....2. *D. aureum*

1. **Dictyosperma album** (*alba*), Balf. f. in Baker, Fl. Mauritius & Seych. 384 (1877). COMMON PRINCESS PALM. Figs. 61, 62, 63, 64, 65, 66.

Areca alba, Bory, Voy. i, 306 (1804).

D. furfuracea, Hort. ex Balf. f., l. c.

D. album var. *furfuraceum*, Bailey, in Hortus 1930, 215; Becc. in Soc. Bot. Ital. xlii, 42 (1935).

D. rubra, Hort. ex Balf. f., l. c.

D. album var. *rubrum*, Bailey, l. c.

Linoma alba, O. F. Cook, in Journ. Wash. Acad. Sci. vii, 123 (1917).

Tree to 15 m. and more high but often blooming only a few feet above the ground, the straight much-ringed trunk 2 dm. or more in diameter

above the enlarged base; trunk dark gray or black: leaves graceful, 2–4 m. long with prominently drooping narrow pinnæ; petiole beyond the sheath plano-convex in section, sharp-edged, glabrous, 20–30 cm. long and 2–3 cm. broad; pinnæ subopposite and uniformly spaced, 50 or more pairs, central ones 60 cm. or more long and to 3 cm. broad, very long-pointed and bifid into thin ends, glabrous unless for shreds or flocculæ on lower half of midrib underneath, midrib prominent on both surfaces and several not very strong side nerves, veins and margins green: tomentum on crown-shaft brown or gray: spathes 40 cm. or so long and one-fourth as broad, glabrous and smooth, finely many-veined: spadix becoming 50–60 cm. long, glabrous, the branches (except lowermost) stout and erect or ascending, peduncle very short and with a prong-like crescent-shaped base that clasps the trunk: flowers reddish-yellow; staminate buds at maturity about 8 mm. long and 5 mm. broad, closely placed on rachillæ, stamens about equalling the long petals; pistillate flowers about 4 mm. long, nearly globular, placed mostly alone on lower parts of rachillæ but between staminates on central part: fruit ovoid-pointed, about 15 mm. long and 10 mm. broad, finely lined when dry, standing at right angles to rachilla, cupule about one-third its length and the parts obtuse, purplish, glabrous; seed ovoid, 10–12 mm. long, prominently pattern-veined on outside, ruminate with intrusions to nearly the white center.

Mauritius where it is probably extinct in a wild state, Round and Flat islands, Rodriguez, Réunion where it is still sometimes met in the wild; accounted the most widely distributed of the Mascarene palms. Commonly planted in warm countries. The "cabbage" (terminal bud) is said to yield excellent salad eaten raw; also material for pickles.

Widely variable species, particularly in the color of petioles and ribs of young plants and in size and direction of the spadices. The effort to maintain named varieties appears to have added to the confusion in understanding this palm. The position of the spadix, whether it stands erect or droops, is probably due to age and to the load the cluster carries. The *furfuraceum* status designates plants in which the leaf-sheath, petiole and rachis are strongly scurfy-tomentose. It is doubtful whether this character is hereditary.

2. **Dictyosperma aureum,** Nicholson, Ill. Dict. Gard. i, 470 (1884). YELLOW PRINCESS PALM. Figs. 64, 66, 67.

Areca aurea, Hort.

D. alba var. *aurea,* Balf. f. in Baker, Fl. Mauritius & Seych. 384 (1877).

D. furfuracea var. *aurea,* Becc. in Nuov. Giorn. Soc. Bot. Ital. xlii, 42 (1935).

Smaller and more slender plant than *D. album,* seldom exceeding 8 m. tall: young leaves and growths orange-veined: leaves smaller, often not much exceeding 1 m. or so long; pinnæ not showing prominent side-ribs

(at least when fresh), the veins either side the midrib hardly noticeable, with the exception of those at or near the base of the blade broad in proportion to length and not extending into elongated narrow point: spadix small, erect or strongly ascending even in fruit; rachillæ slender, the denuded pits (after fall of flowers) closer together and relatively deeper than in those of *D. album:* staminate flower-buds about 5 or 6 mm. long when ready to open and flowers white or pale yellow: fruit likely to be somewhat longer and more slender than that of *D. album.*

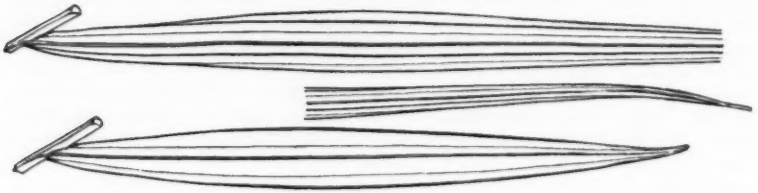
Rodriguez, where according to Balfour in his Botany of that island, it grew in his time "freely both on the volcanic soil and on the coralline limestone." He stated (1879), "It has for many years been cultivated in the gardens of Europe, as *Areca aurea.*" He considers it not to be specifically distinct from *D. album.* Professor Vaughan wrote me in 1935 that this palm "is still to be found wild in fair quantity" on Rodriguez; "however, during periodic droughts or food shortages it is felled in large numbers for the sake of the edible crown-shaft, and it will therefore probably become extinct in a few years."

It is difficult to typify this palm for purposes of critical diagnosis. In the British Museum are two pieces of leaves labelled *Dictyosperma alba* var. *aurea* and collected by Balfour on Rodriguez, on Transit Expedition that took him to the island. The pinnæ are long-pointed and narrow and side-ribs are prominent. They look like parts of a leaf from a very young plant. At Kew is a sheet from John Horne grown in the Mauritius Gardens but the source said to have been Rodriguez. Pinnæ, spathes, inflorescence are represented, together with dissections of flowers in pencil on the sheet. These parts correspond well with my conception of *D. aureum* except that the pinnæ are very long-pointed; they apparently represent parts taken below the middle of the blade.

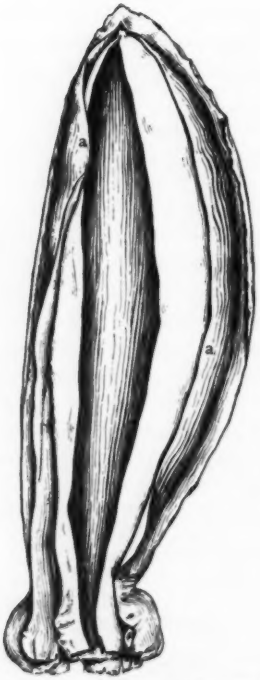
Trees grown in southern Florida as *D. aureum* appear to meet the definitions. I have compared the flowers with the drawings of Horne on the Kew sheet. Rachillæ also correspond with my specimens taken in the wild on Rodriguez; Fig. 66 compares the Rodriguez rachilla with that of var. *rubrum* for Mauritius. I have no leaves or fruits of *D. aureum* from Rodriguez. In Fig. 64 I compare a pinna of *D. aureum* grown in southern Florida with a pinna of *D. album* grown on Mauritius, both taken from the middle of the blade, showing differences I take to be characteristic. In the Florida trees of *D. aureum* the lower pinnæ on the blade are likely to have very long attenuate ends.

63. THE CARTRIDGE-LIKE FRUITS of Dictyosperma, showing attachments. Nearly natural size. Grown in Brazil. *D. album.*

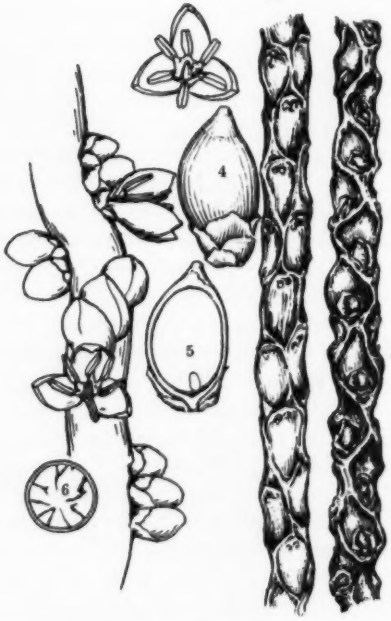
It would be interesting to know whether



64. THE CONTRASTING PINNÆ of *Dictyosperma album* (above), and *D. aureum*. About one-third natural size.



65. DOUBLE SPATHE OF PRINCESS PALM, *Dictyosperma album*, about one-fifth natural size. Outer or main spathe at a, a, inclosing the thin inner spathe or valve whose margins are shown in white. This spathe has fallen away from the spadix.



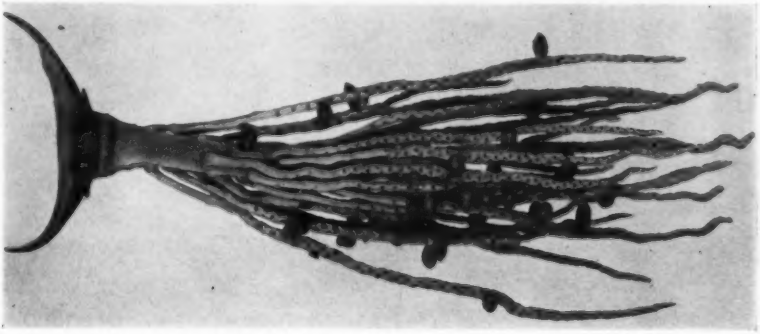
66. FLOWERING AND FRUITING PARTS of princess palms. Flowers of *Dictyosperma album*, × 3. Fruits of *D. aureum* at 4, 5, and 6, natural size. Rachillæ, somewhat enlarged, of *D. album* and at right of *D. aureum*.

trees grown in Florida from seeds brought directly from Rodriguez would retain the original characters; to determine this question would require complete specimens and good photographs of the Rodriguez parent. The solving of nice problems like this should be one of the delights in forthcoming years of those who now begin to plant the palms and then to study them in the southernmost places of the United States.

ACANTHOPHŒNIX—BARBEL PALMS

Bory de St. Vincent described two more or less spine-bearing palms from the Mascarene islands in his Voyage of 1801–2, *Areca rubra* and *Areca crinita*. Under these names the palms were known from the wild and in cultivation until in 1867 Hermann Wendland named them *Acanthophœnix rubra* and *Acanthophœnix crinita* in the Belgian journal Flore des Serres; and these are their botanical names at the present day. At that time the old and inharmonious genus Areca was in the process of being broken up into consistent parts or genera, a procedure probably not yet complete.

The barbel palms were in cultivation in Europe when Wendland wrote. One sees them now and then in tropical America but they are less frequently planted than the princess palms, of the genus Dictyosperma. I have not seen them in the United States. Apparently they have been confused by planters with Dictyosperma. They have distinct ornamental value, although the spiny nature of foliage and flower-clusters may have hindered their popularity even if the armature is not vicious and is ornamental. They are feather-leaved palms with foliage, at least in young plants, displaying interesting color, and the contrasting effects of the black or brown spines and hairs, and sometimes the tomentum, make them striking subjects for the cultivator.



67. SPADIX AND MATURE FRUIT of *Dictyosperma aureum*. × ⅛. Southern Florida.

5. **ACANTHOPHŒNIX,** Wendl. in Fl. des Serres, xvi, 181, t. 1706–7 (1867).

Monœcious pinnate-leaved barbed palms with erect single closely ringed spineless trunk and hanging inflorescence at base of crown-shaft, medium to tall in height: leaves long, arching or the lower ones somewhat

68. BARBEL PALM, *Acanthophœnix rubra,* planted in Mauritius and also native there.

drooping, closely and equally pinnate, pinnæ long and narrow with extended slender bifid apex and strongly midribbed and nerved, sheaths spine-bearing: spathe 30–60 cm. or more long, of two valves, to 10 cm. broad, thin and papery at maturity and deciduous; spadix stout, twice branched, the rachillæ 50 cm. or less long and more or less fleshy with flowers firmly set

69. Barbel palm, *Acanthophoenix crinita*, native and planted in Mauritius.

on them, short clasping peduncle spiny or tomentose or papillate: flowers unisexual, sepals and petals 3, typically one pistillate just underneath two staminates, the staminates 5–6 mm. long, valvate petals narrow and acute and very much exceeding the sepals, stamens 9–12 and more or less grouped, prominently exserted at full anthesis with white versatile anthers and filaments usually tortuous, pistillode columnar-conic and small with tridentate apex; pistillate flowers small, globular-conic, with valvate petals that exceed the calyx and containing minute staminodes: fruit 12–13 mm. or less long, globose or oblong, hard, micropyle below middle or near base, mesocarp thin; seed single, filling the cavity, the white hard albumen continuous (not ruminate).

70. SPADICES OR INFLORESCENCES IN BLOOM of *Acanthophœnix rubra* (left) and of *A. crinita* (right). Mauritius.

The nearest ally of Acanthophœnix is undoubtedly Deckenia, monotypic genus of the Seychelles. Hooker in 1883 in Bentham & Hooker Genera Plantarum (iii, 898) considers Deckenia to be a species of Acanthophœnix, and Drude in 1889 in Die Pflanzenfamilien (ii, abt. 3, 71) raises the same question. Beccari in his posthumously published work on the Areceæ keeps the two genera separate. Deckenia, with its short broad densely echinate spathe, minute staminate flowers, 9 stamens, narrow nerved fruits and forked raphe, appears to be abundantly distinct from Acanthophœnix; and this conclusion is in agreement with the endemic dissimilarity of the other palms in the two archipelagoes, and I have kept them distinct in my Seychelles paper. Balfour accepts Acanthophœnix in Flora of Mauritius and the Seychelles.

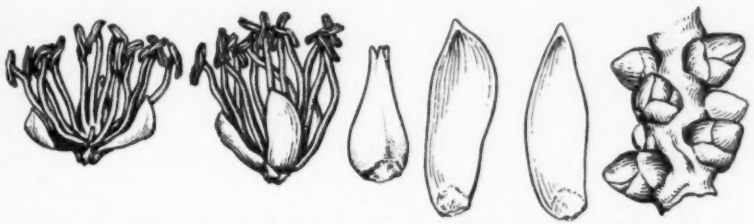
Spines on nearly or quite glabrous peduncle straight or at least not undulate: fruit globose, raphe-ridged on one side: lateral ribs of pinnæ not unusually prominent: filaments very stout: staminate flowers reddish or purplish, the petals to 12 mm. long ..... 1. *A. rubra*

Spines on tomentose peduncle long and undulate: fruit oblong-ovoid, not conspicuously raphe-ridged, small: two side ribs of pinnæ nearly as prominent underneath as midrib: filaments slender: staminate flowers white to yellow to pink, the petals to 8 mm. long ..... 2. *A. crinita*

1. **Acanthophœnix rubra,** Wendl. in Fl. des Serres, xvi, 181 (1867). Red Barbel Palm. Figs. 68, 70, 71, 73.

Areca rubra, Bory, Voy. i, 306 (1804).

Tree to 20 m., foliage of young plants bearing red veins: leaves 2–4 m. long, outstanding in the head, smooth except for long bristles on rachis and midribs underneath, the long sheath thickly beset with weak black shining spines to 3 cm. long, petiolar part glabrous; pinnæ many, long lance-linear extending into slender bifid point, middle ones 4–5 cm. broad, lighter colored as if glaucous underneath: spathes to 75 cm. long, bare unless for a few spines at or near base; spadix to 1 m. or more long, soon hanging on a short curved peduncle that is armed with stiffish nearly or quite straight spines of different sizes, the rachillæ nude except at base: flowers densely placed, making bushy strands to 10 mm. thick, the small pistillate blossoms



71. The flowers of *Acanthophœnix rubra.* Flowers somewhat more than natural size. Pistillode about four times natural size. Petals more than two times enlarged. Pistillate flowers in bud stage, more than full size.

well hidden when the staminates are in full anthesis; petals of staminate flowers 10–12 mm. long, oblong and briefly acute, nerved, reddish-purple, three or four times exceeding the broad scale-like whitish sepals; stamens about twice longer than corolla, anthers narrow-sagittate; pistillate flowers about 6 mm. long, the closely wrapped obtuse sepals about one-half as long as the tight petals, stigma trifid and sessile on side of ovary: fruit drupe-like, practically globular except for the covered ridge of the raphe, 10–14 mm. diameter, shining black at maturity, the thin exterior fleshy, mesocarp fibrous, the explanate cupule remaining on the rachilla and 10–12 mm. broad.

Mauritius and Réunion.

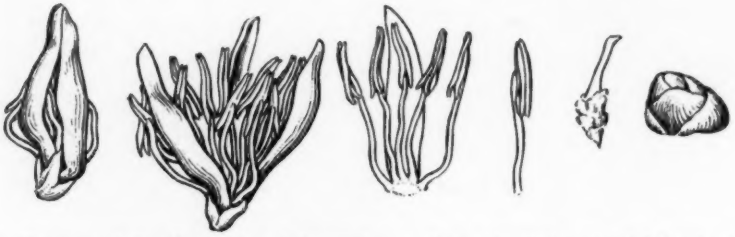
Probably extinct in native state in Mauritius; only one cultivated specimen is known, in the Botanic Gardens in Curepipe. According to Bojer it was once common in high stations about Curepipe and elsewhere. Bory states that it was common in forests at medium altitudes and was remarkable for its great height, being the tallest of the native palms.

Very common on Réunion, according to Cordemoy, who states that the terminal bud (cabbage) is much esteemed for food.

2. **Acanthophœnix crinita,** Wendl. l. c. t. 1706–7. YELLOW BARBEL PALM. Figs. 69, 70, 72, 73.

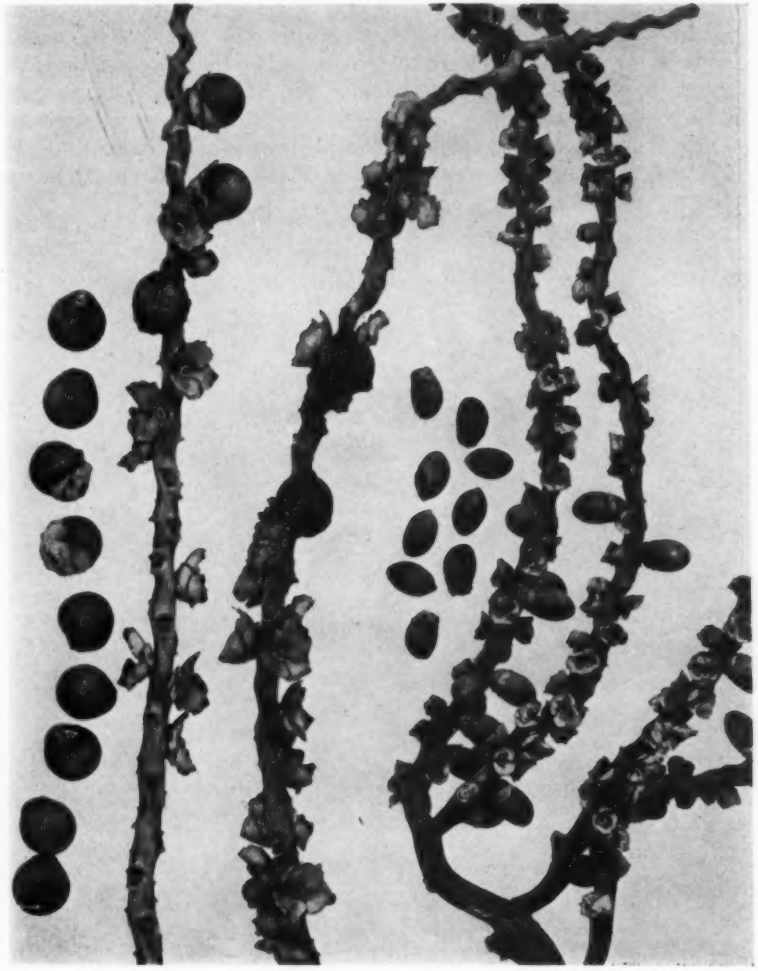
Areca crinita, Bory, l. c. 307.

Young trees with yellowish-green foliage: petiole tomentose or papillate, the sheath bearing bristles and also slender flexile spines to 20 cm. long, rachis practically nude unless for more or less tomentum but pinnæ with a few bristles and more or less fluff on midribs underneath and the under surface whitish (particularly on young plants) and two lateral ribs prominent, width less than in *A. rubra:* spathe and spadix shorter than in *A. rubra,* the former tomentose on outside; spadix with tomentose peduncle and the upper part as well as branches bearing stiff spines to 16–20 cm. long and most of which are undulate, the more or less sinuous or zigzag rachillæ drooping: petals of staminate flowers about 8 or 9 mm. long, muticous, not nerved, white to yellow to pale pink, acute sepals much



72. FLOWERS of *Acanthophœnix crinita,* much more than natural size, one at left not yet expanded. Stamens enlarged. Pistillode four times natural size. Pistillate bud more than twice full size.

shorter, the slender stamens not twice longer; pistillate flowers at anthesis about 4 mm. long: fruit oblong-ovoid, 9–11 mm. long and about 6 mm. thick, somewhat unequal-sided, black, the persistent cupule about 6 mm. broad.



73. RACHILLÆ AND FRUITS OF BARBEL PALMS, natural size. At left, two strands and globular fruits of *Acanthophœnix rubra*. At right, crooked strands and small oblong fruits of *A. crinita*. Received from Mauritius.

Mauritius and Réunion. Apparently the commoner species in general cultivation.

On Mauritius it was common in Bojer's time at Quartier Militaire and Black River. Now it is very rare in the wild state; a few plants may still be found at La Pipe near Midlands and in the neighborhood of Kanaka and Grand Bassin. Horne states that in his time this palm was common in forests in the interior of Mauritius. The demand for the cabbage is probably one of the reasons for its disappearance, but he said that wild pigs and monkeys destroy the young plants; monkeys pull out the heart leaves and eat the tender bases. The species is now frequent in cultivation.

Cordemoy states it is very common on Réunion, growing in the mountains up to 2,000 meters.